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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

THE YEARS OF PROJECT HTAUTOMAT, 1956 - 1958

VOLUME I

by



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Foreword

This segment of the history of the National Photographic Interpretation Center, covers the years of HTAUTOMAT, the organization devised to exploit photography collected by the U-2 reconnaissance system. HTAUTOMAT consisted of a confederation of ORR photo interpreters and OCR information-handling specialists under a single operating head, the chief of the ORR Photo Intelligence Division. Collocated with CIA personnel in the HTAUTOMAT Steuart Building were the Army, Navy, and, at times, Air Force photo interpreters.

This segment covers the exciting discoveries on photography from the initial group of missions that penetrated western European Russia in July 1956 and the abrupt transition to use of the U-2 to gather indications and tactical information relating to the Suez crisis later that year. It continues with the acquisition, in the summer of 1957, of photography covering nuclear and missile installations in Soviet Central Asia and the spectacular success of JAM SESSION, the unprecedented all-source effort undertaken to exploit that

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photography. It closes with the termination of Project HTAUTOMAT and the establishment of a permanent organization at the Office level, the CIA Photographic Intelligence Center, to carry on the interpretation of high-resolution photography from the U-2 and from advanced overhead reconnaissance systems then under development.

As in the earlier history, documents such as monthly reports, memorandums, minutes of meetings, and photographic intelligence publications provide most of the basic facts and dates. Recollections of key HTAUTOMAT personnel add the human interest. Unless noted otherwise, references cited in this volume are available in the NPIC Historical Collection, housed in the NPIC Library.

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER
THE YEARS OF PROJECT HTAUTOMAT, 1956 - 1958

VOLUME I

I. The First Looks Behind the Iron Curtain

With removal of the OCR Statistical Branch* and most of the ORR Photo Intelligence Division to new quarters in the Steuart Building on 9 July 1956, 1/** full-scale implementation of Project HTAUTOMAT*** had begun (Figure 1).**** Here, on the upper floors of a

* The Statistical Branch was established to provide non-PI support to photo interpreters; its formation is described in DDI history, NPIC-2, *Antecedents and Early Years, 1952-56*, pp. 139-147. See also pp. 3, 12-14, below.

** For serially numbered source references, see Appendix C.

*** It is explained in NPIC-2, cited above, p. 139, that Arthur C. Lundahl who became chief, Project HTAUTOMAT, chose the name base AUTOMAT because he "envisaged the operation as the Horn and Hardart of the Intelligence Community, with its doors never tightly closed and with customers going in and out, day and night."

**** The figures (photographs) are bound together in Volumes IV, V and VI.

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building housing a downtown automobile sales and service organization, photo interpreters from the Office of Research and Reports (ORR) working with collateral and other support personnel from the Office of Central Reference (OCR) joined forces as an all-source photo interpretation and publication unit to exploit U-2 photography (Figure 2) and report the results to the Intelligence Community. Any lingering concern about the ability of the new organization to exploit the photography or cope with the flow of inputs was almost immediately dispelled. HTAUTOMAT (HTA) quickly became the toast of Very Important Persons in the US Government. Others in the Intelligence Community who were witting but lacked the prestige needed to obtain desktop briefings in their own offices or presentations in their own briefing rooms beat a path to the door of 1014 Fifth Street, Northwest, situated between the Steuart Insurance Agency on the one hand and the automobile parts department on the other. There were those, mostly security types, who felt that this arrangement, augmented by an ancient and completely irrelevant directory in the lobby, provided a disguise impenetrable to all save the most aggressively curious, but they either conveniently forgot or were never aware of the sign,

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"Rented to CIA," that was displayed at the entrance for some days prior to the arrival of the new tenants.

A. The Anatomy of HTA

For the first year of its existence, Project HTAUTOMAT preserved the outward form decreed on the occasion of its approval. Whatever the turn of events, whatever the task to be done, it was accomplished within the framework of an organization based on a hypothetical set of circumstances. Even the name, Project HTAUTOMAT, suggested the measure of uncertainty in the minds of its creators who made no pretense of concealing the fact that it was a pilot operation.

The major element in the organization was the Photo Intelligence Division, D/GP, responsible to [redacted] [redacted] chief of the Geographic Research Area, Office of Research and Reports. In turn, D/GP was divided into four branches and two staffs (Figure 3). Three of the branches were intended primarily for interpreting the photography and the other for photogrammetric support. A Support Staff was oriented toward exploitation operations, and an Administrative Staff functioned as the housekeeping unit.

The lesser of the two elements of Project HTAUTOMAT, the Statistical Branch of the OCR Special Register,

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operated under the leadership of the chief of HTAUTOMAT but retained its administrative ties to OCR. This branch provided a wide range of reference and production services not available from the D/GP Support Staff.

Though the T/O for the ORR element provided for 92 persons plus two IAC slots for military personnel, only about half were in place when HTA components moved into the Steuart Building. Moreover, those on duty were very unevenly distributed among the staffs and branches.

1. Office of the Chief

When the ORR photo interpreters were placed under Project HTAUTOMAT, their chief, Arthur C. Lundahl, became chief of the project. With him went [redacted]

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[redacted] his deputy, and [redacted]

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who had been working with Lundahl to build the new organization since the previous fall. [redacted] was transferred to the D/GP table of organization on 12 August 1956 as an administrative officer-executive. 2/

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2. Special Projects Branch

During the first year, the Special Projects Branch (SPB) was the largest and most active of the ORR components; in August 1956 this branch consisted of 17

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professionals* and one clerical under the dynamic and autocratic leadership of [redacted] 3/ 25X1

Initial projections of U-2 operations had envisaged frequent undetected deep penetration flights over the USSR with correspondingly frequent inputs of photography requiring rapid exploitation and immediate reporting to the Intelligence Community. This first phase of the exploitation process would involve plotting and scanning of the photography, communicating the results of exploitation by word of mouth and with the aid of photographic briefing boards if the targets were of national intelligence interest, and feedback to the collectors concerning quality of the imagery and coverage of targets reached. Completion of all these tasks for each mission was planned for six days or less after receipt of the material at HTA. 4/

The level of staffing in SPB reflected the heavy workload expected to result from such an ambitious schedule. Obviously, this involved staffing to meet peak-load requirements; any interruption or irregularity

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[redacted] The last four were graphics personnel. 25X1

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in the receipt of new materials would be bound to create a need for self-initiated work to take up the slack.

Though [redacted] was never at a loss to provide productive work whenever it was needed, this arrangement evoked from the other two PI branch chiefs misgivings about the level of their staffing as well as SPB encroachments on their domain and boded ill for the durability of such a solution.

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3. Industrial and Geographic Branches

The Industrial Branch, headed by [redacted] and the Geographic Branch, led by [redacted] shared the detailed reporting responsibility. Almost immediately, however, the division of work implicit in the branch titles was rendered out of date. The so-called Industrial Branch became heavily committed to the analysis of military and scientific targets in support of OSI, whereas most studies of conventional industries in support of the ORR Economic Research Area were assigned to the Geographic Branch. In any case, the magnitude of the demand for detailed work had been very unclear from the beginning, though it was generally assumed to be large. Even so, the detailed interpretation would have to give way to first-phase exploitation in any competition for staffing, since no delay could be

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tolerated in reporting important intelligence finds to the Community.

These facts of life were reflected in the number of persons assigned to the two detailed interpretation branches. By 15 July 1956, the Geographic Branch had four PIs on board.* 5/ In August 1956, the Industrial Branch had just five interpreters.** 6/ Nor could any of these be called highly trained specialists with reference to the types of targets on which they would be expected to report. Most could be described as competent and experienced PIs reasonably well versed in PI techniques and their application to the interpretation of traditional targets on reconnaissance photography.

For the Geographic Branch which was concerned primarily with area studies and the photo readout of conventional industrial plants, this posed no great problem. Circumstances in the so-called Industrial Branch were entirely different. PIs in this branch would be faced with the identification, description,

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and functional analysis of exotic targets unknown, heretofore unseen, and only vaguely understood, if at all, by US intelligence analysts and even by American scientific and engineering talent involved in the development of advanced US military weapons systems. In this case, the penalties would be delays in fully exploiting the photography, a heavy commitment in orientation and training, and the painful development of complex and productive working relationships, within and outside the Intelligence Community, between organizations and persons, each of whom had some critically needed ability or information to contribute but none of whom alone could provide all the required facts or insights.

4. Technical Intelligence Branch

Headed [redacted] the Technical Intelligence Branch, which consisted of only four persons for most of the first year,* 7/ faced an exceedingly diverse array of responsibilities and problems that were well beyond its capability to handle. There were critical measurements to be made in support of projects

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[redacted]
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in the detailed reporting branches and even occasional jobs of the same type for the Army liaison shop and the Special Projects Branch. More basic to the rapid exploitation of the new photography was the need to compute and publish scale tables for use by the PIs themselves in making routine measurements, a staggering job of computation. As if this weren't enough "just for openers," the branch had heavy collection systems development and testing commitments for the Deputy Director for Plans (DDP).*

With so few people spread over so many demanding tasks, the branch, though officially activated as an organizational entity, was hardly able to function as a cohesive unit. Indeed, the branch chief was absent much of the first two months on TDY in Europe and subsequently faced an extremely heavy schedule of travel in connection with one of the DDP projects. Moreover, the others in the branch also made many similar trips during the first year of HTA operation. Fortunately, three of the four were senior employees and all were capable of working productively on their own initiative

* Since 1973, the Deputy Director for Operations (DDO).

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and without close supervision. Nevertheless, the effect of these absences worked counter to branch development and made more difficult the job of meshing TIB activities with those of other division components.

5. Support Staff

Coming into existence as a unit with broad responsibilities but ill-defined authority, the Support Staff, under [redacted] struggled to strike a satisfactory balance between peremptoriness and persuasion in assisting the Chief, HTA, to coordinate and control project work being undertaken by the several different branches. Specific functions included liaison with requesters, researching and assigning requirements, obtaining collateral aerial and ground photography, controlling or monitoring of production, assigning of photo lab priorities, and editing of manuscripts for detailed reports.

During most of the summer of 1956, professionals on the Support Staff consisted basically of [redacted] 25X1

[redacted] both of whom were primarily concerned with requirements, liaison, and production control. For about two months, the staff also included [redacted] 25X1 who transferred to DDP on 14 September 1956. 8/ The editorial function remained dormant until the arrival of

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[redacted] from Office of Basic Intelligence (OBI) on

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17 September. 9/

Most significant among the problems was the question of how much authority the staff would have in dealing with the branches. Though a serious attempt was made by the staff to establish itself as a focal point in handling requirements, in coordinating liaison on project work, and in exerting some measure of production control through the assignment of priorities and the monitoring of progress toward the completion of projects, these goals proved too ambitious to realize fully in competition with line managers. The editorial function, a difficult one at best, presented further complications involving the role of the editor, his relation to the analysts, and the extent of his responsibility and authority in revising manuscripts and in preparing copy for publication. As if these problems weren't challenging enough, there was the obvious question as to why the Support Staff should provide collateral photography when the Information Section of the Statistical Branch furnished all other reference materials. Moreover, in any future dispute, the logic implicit in this question would have strong sympathetic support from PI branches annoyed by the inevitable

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tensions over such matters as requirements, liaison, production controls, and editing.

6. Administrative Staff

The Administrative Staff was responsible for security, personnel matters, and finance, and had no lack of work during the first year of operation, but lagged in its internal development. For the entire first year -- and longer -- it lacked a formally designated chief. 10/

Senior incumbents, in terms of grade, were [redacted]

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[redacted] 11/ who were security officers

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not permanently assigned to the staff. They had no prime interest in affairs of the staff, other than those involving security, and operated in a semi-autonomous manner. *De facto* leadership was provided by [redacted]

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[redacted] who, though slotted in the office of the chief, had a strong interest in personnel and other administrative matters and assumed many of the duties of the non-existent chief. Within the staff, leadership in the handling of routine work was provided by [redacted]

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an administrative assistant occupying a GS-09 slot. 12/

7. Statistical Branch, OCR

With a T/O of 53 persons, the Statistical Branch of OCR was by far the largest branch in HTA. Its mission was to obtain reference materials needed by the

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PIs and render documentary support to them in their exploitation activities, provide HTA with an information storage and retrieval capability, index TALENT System reports prepared by other agencies, furnish photo lab and reproduction facilities, and to control, file, and distribute TALENT materials. 13/ At the time of the move to the Steuart Building, the Statistical Branch comprised only 18 persons, but by the end of July 1956 the count was 30 and continuing to rise. 14/

With the growth in size and with the diversity of functions, the Statistical Branch lost little time in developing its internal structure and naming appointees to key positions. As initially planned, there would be three sub-units, now called sections: the Information Section, under Dino Brugioni; the Technical Section, under [redacted], who had just arrived from OCI; and the Support Section, under [redacted] All these operated under the nominal leadership of [redacted] [redacted] of the OCR Special Register, with [redacted] chief of the Statistical Branch (Figure 4), [redacted] his deputy, functioning as resident managers in the Steuart Building. 15/

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As part of the glamorous and growing HTA organization, the character of the Statistical Branch was set by a

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resourceful and ambitious leadership anxious to capitalize on every available opportunity to complement the capability of ORR photo interpreters and to serve interagency committees and boards concerned with the collection and exploitation of U-2 photography. A fiscal-year-end report issued in August 1957 by the Statistical Branch catalogued seven major activities in which it had become involved beyond the original concept of the project. At the same time, attention was called to the urgent need for additional personnel. This was, indeed, a dynamic group, ever pressing forward with imagination and invincible determination. It was a worthy partner for D/GP in their historic joint effort to bring intelligence developed by the exploitation of high-resolution aerial photography against a background of all-source information to bear on the solution of problems of national significance.

8. Military Liaison Components

Though each of the participating services was originally expected to have only two liaison officers, the Army, from the beginning, had decided to join HTA in conducting exploitation activities in the Steuart Building. Known as the HTAUTOMAT Liaison Branch, Collection Division, Office of the Assistant Chief of Staff,

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Intelligence, the Army group was initially under [redacted] 25X1

[redacted] who was soon succeeded by [redacted] 25X1

[redacted] By August 1957, the branch had a T/O 25X1

of 60, with 25 persons on board at HTA. The Navy, slower than the Army to make a commitment to assign PIs to work in the Steuart Building, was represented for several months by [redacted] 25X1

[redacted] By early 1957, however, [redacted] 25X1

[redacted] a civilian, were assigned to work in 25X1

the Steuart Building as PIs, and by August of that year the number of Navy personnel had grown to six. 16/

The presence of these service PIs had a small but significant impact on HTA operations. During the year ending in July 1957 the effect was felt mainly by support components, such as the Technical Intelligence Branch which provided critical measurements for several Army projects, 17/ the graphics personnel in the Special Projects Branch who produced many illustrations for both the Army and the Navy, 18/ and the Statistical Branch, OCR, which furnished reference materials, photo lab support, and reproduction services. 19/

Though it had no functional relation to the presence of Navy liaison officers in the Steuart Building, until February 1957 20/ the HTA photo lab supplied LogEtronic

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prints for use by Navy photo interpreters, pending completion of their TALENT-cleared facility. By December 1956 the number of these prints had increased from several hundred to several thousand a month. 21/ To help cope with this increase, the Navy assigned lab personnel to the Steuart Building for the duration of the arrangement. 22/

Beyond the then current impact, the early entry of the Army into the Steuart Building in some force and the later assignment of Navy PIs to work there had profound long-range implications. Lundahl had long advocated, at least as an ideal arrangement, centralization of photo interpretation in support of national intelligence objectives. Though the major thrust of Army work in the Steuart Building during the first year was directed to the answering of departmental requirements, the close association of Army and CIA personnel, as well as the small Navy working presence, set a precedent and established working relationships that constituted first steps toward the realization of a joint National Photographic Interpretation Center (NPIC).

9. Central Branch

Officially, the Central Branch, headed by

[redacted] didn't exist. This ad hoc

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arrangement created obvious staffing difficulties for the parent organization as well as supervisory problems for the chief, who officially occupied a special assistant slot in the office of the division chief. Nevertheless, it did provide an informal scheme for serving the needs of those not witting of the larger operation in the Steuart Building. Not only did it provide a point of contact for Agency requesters outside the TALENT System, but it also handled the exploitation of non-systems photography, including that from DDP, the planning and operation of the D/GP photo interpretation course, and the housing and temporary employment of HTA/DGP recruits who had been granted their TS clearance but were not yet briefed into the COMINT System.

Initially consisting of four PIs* who were left behind on an indefinite assignment, 23/ the unit was at first alluded to as the "Task Force" until the move from Que Building to new quarters in the Central Building in late September 1956 suggested a more appropriate name (Figure 5). Though the branch had no facilities in the

* [redacted] formed the initial nucleus of the Central Branch. Until early 1957 [redacted] also spent up to several days a week at Central Building, primarily as a personal convenience with respect to his part-time program of study at George Washington University. Late in the summer of 1956, [redacted] who (footnote continued on following page)

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Central Building for handling TALENT or COMINT materials, all permanently assigned members were both TALENT and COMINT cleared. The bulk of Central Branch work during the first year of its separate existence involved interpretation of non-systems aerial photography of the Far East, GENETRIX coverage of the Sino-Soviet bloc, and support to DDP in the collection and exploitation of clandestine photography.*

B. The First Eight Missions Dominate Events of July and August

In any given case, a handful of prime targets determined the route of a U-2 mission and, hence, circumscribed the limits of what might be captured on the photography. In July 1956, highest priority targets, all within the USSR and China, fell in seven categories:

(footnote continued from preceding page) entered on duty in D/GP 20 August 1956, joined the initial group. At any given time, this basic work force was augmented by the transients on their way to permanent assignments in the Steuart Building.

* Monthly reports of the Photo Intelligence Division provide the only periodic record on activities of the Central Branch for more than the first year of its existence. Since these reports were held to the SECRET level, by far the larger portion of details under the heading, "Projects and Reports," referred to work done in Central Branch. Entries under other headings, such as "Administration and Planning," "Coordination," and "Miscellaneous," covered events and personalities both in Steuart Building and Central Building; those assigned to the latter can only be deduced from the persons involved or from the context.

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1) long-range bomber bases and program, 2) air defense, 3) atomic energy installations, 4) guided missile installations, 5) naval bases and shipyards, 6) industrial complexes, and 7) disposition and capabilities of military forces. 24/ The somewhat diffuse nature of these targets reflected the paucity of existing intelligence as well as the unrepresentative nature of targets covered by the first eight missions, which had recently been completed.

A second factor important in determining the potential coverage on any single mission was the range of the U-2, approximately 3,400 nautical miles without refueling. 25/ At the time collection operations were initiated, early in the summer of 1956, there was but one base of operations -- Wiesbaden, AFB, Germany. 26/ Thus, missions over the USSR from this base were necessarily confined to western or southern Russia; it was not possible to reach targets in the Urals or Soviet Central Asia from Germany. Moreover, coverage of the Middle East during the Suez crisis in the fall of 1956 proved difficult, or, in some cases, impossible from Germany (Figure 6).

Spurred on by these limitations, a second unit was deployed [redacted] in August 1956. 27/ From this

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base, coverage of the entire Middle East could be obtained with little loss of time over lands of transit. In addition, many parts of the Urals and Soviet Central Asia were within reach from [redacted] but almost no attempt was made during the first year of operations to realize this potential.

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1. The Eight Missions and Their Objectives

Between 20 June and 10 July 1956, eight missions were flown out of Wiesbaden. The first three covered only portions of the European Satellites. The next five penetrated the USSR (Figure 7); of these five, the first two and the last one were the most important. Following the 10 July mission, there was a long stand-down of further penetration flights as a result of official Russian protests charging violations, albeit understated, of Soviet air space. 28/

The first Russian penetration mission was flown, by sheer coincidence, on 4 July 1956. It reached Leningrad and covered portions of the Baltic States, including Poland and Finland, en route. 29/ The chief goal on this mission was the naval shipyards in Leningrad. 30/ It was hoped that coverage of these shipyards would shed light on the construction of submarines, including possible evidence of any that might be nuclear powered or armed with missiles.

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The second of these five missions, flown the next day, 5 July 1956, penetrated to Moscow. 31/ The course flown described a loop over the Fili airframe plant, where Bison's, the Russian counterpart of the B-52, were built, and Ramenskoye Airfield, the ultimate fly-away field for Bison's assembled at Fili. It was also expected to provide coverage of the Kaliningrad missile plant and the Khimki rocket engine plant. 32/

The last of the five missions, flown on 10 July 1956, reached the Crimean Peninsula, 33/ where it was hoped coverage could be obtained of naval storage and missile testing facilities.

In addition to the ultimate goals set, each of the missions over the USSR was expected to provide coverage of numerous other targets of intelligence interest, such as the Soviet long-range air bases, 34/ fighter bases in both Russia and the Satellites, other types of military installations, and industrial and urban complexes.

2. Immediate Exploitation of the First Eight Missions

Consistent with the immediate reporting responsibility of HTA, the first products from each mission were large photographic briefing boards depicting high-priority installations in the USSR or the European Satellites. Each briefing board consisted of a

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photographic enlargement measuring approximately 18 by 20 inches mounted on a piece of drawing board 22 by 30 inches so as to provide space for titling and annotations at the right side of the photographic panel. These were used primarily as adjuncts to an oral presentation of the facts revealed from the photography.

The pattern thus set for the initial dissemination of information from U-2 photography was to continue for years to come. Though the basic approach -- oral presentations with the use of briefing boards -- was neither original with nor unique to HTA, it was a method extremely well suited to the job at hand. Some of the photography was little short of spectacular, and Lundahl, who gave most of the briefings when he was available, had no peer as a dynamic and articulate apostle of photo intelligence.

By the end of August 1956, all the initial exploitation work on the first eight missions had been completed, thanks in part to the stand-down on additional penetration missions. This included not only plotting, scanning, and technical evaluation of the photography, but also the preparation of ELINT plots required by the AQUATONE Project Director, Richard M. Bissell, and the Office of Scientific Intelligence (OSI). 35/

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As far as substance was concerned, the greatest immediate impact was obtained from photography of Soviet bomber bases with their associated nuclear weapons loading and storage facilities. The first five Russian penetration missions had covered no less than nine of them. Not only were these airfields of high interest because of their facilities for handling offensive weapons, they were also an object of much speculation because of the aircraft that were *not* found there. At the time of the July 1956 U-2 missions, not one Bison was present at any of the nine long-range airfields. This was a datum that did not go unnoticed by the foes of the Air Force. It was not long before the so-called "Bomber-Gap" was proven a myth, 36/ and information obtained from U-2 photography played a key role in the reassessment.

Of longer range interest was the perplexing installation with the big domed structure, near Mozhaysk. This was reported in a Mission Coverage Summary during the summer of 1956 simply as an unidentified housing and institutional area with one building hemispherical in shape. 37/ Though it would be several months before a crash effort could be undertaken in an attempt to solve the enigma, by the end of August it was already

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recognized as a target of considerable interest. 38/

3. Detailed Exploitation During July and August 1956

Interesting discoveries during the initial or immediate exploitation phase gave rise to requirements from analysts desiring specific, detailed information concerning installations of special interest to them. Some of these requests resulted from the high-level briefings on targets of the greatest interest, but even more were generated by Mission Coverage Summaries, the index-type publications resulting from scanning the photography. Work on these requirements for detailed exploitation of photography covering selected installations was carried on in the Geographic and Industrial Branches. The level of effort and volume of products were much smaller, however, than those associated with first-phase exploitation in SPB, which had nearly twice as many interpreters as the other two PI branches together.

Production from the two detailed reporting branches during July and August 1956 consisted of two Photo Intelligence Alerts, 14 Photographic Intelligence Briefs, and two Photographic Intelligence Memorandums. All were issued in August. At this early date there was as yet

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little departure from the traditional approach to PI reporting. Whatever the format, there was, typically, an introductory paragraph or section followed, when details were available, by a list of items explaining annotations made on an accompanying photograph or line drawing.

Subjects covered reflected Community interest in prime targets covered by the first eight missions as well as a number of installations of minor importance. The latter reflected not only the interest of individual analysts in their particular targets, whatever their importance from a national point of view, but also the fact that at this early date there was no clear focus -- indeed, there could be no clear focus -- on the precise type of work that should engage the limited resources of the photo interpreters.

The first Photographic Intelligence Brief issued was dated 8 August 1956 and gave a description, keyed to a line drawing, of major components of Fili Airframe Plant No. 23, 39/ one of the prime targets on the 5 July mission over Moscow. It was done in the Industrial Branch. Between 22 and 24 August, five briefs originating in the Geographic Branch reported on Lenin-grad shipyards, which had been the ultimate goal of the

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4 July mission. 40/ On 28 August, a brief done in the Industrial Branch reported that the 4 July photography revealed no evidence of SAM sites, like those around Moscow, in the Leningrad, Riga, and Kaliningrad areas. 41/ Though negative in thrust, this answered a question of considerable interest to those concerned with problems of penetrating Russian defenses.

In spite of the considerable accomplishments resulting from the exploitation of photography obtained on these early missions, not one of the early publications reported anything of outstanding importance or enduring interest. Ironically, not even a brief was issued during the first two months on the Russian SAC-type airfields. Nor was there any reporting at this time on the installation near Mozhaysk, except the obscure and uninformative item in the Mission Coverage Summary.

In addition to work completed and publications issued during July and August 1956, work was under way in the Geographic and Industrial Branches on many other projects, some of which were of real importance and long-term interest. Potentially most rewarding was work tied up in the Geographic Branch on five Russian bomber bases pending a decision as to whether or not concurrent PI reports emanating from the military services would

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satisfy the OSI requester. 42/ By the latter part of August several informal PI-analyst conferences had been held concerning the Mozhaysk installation and two requirements had been received in the Industrial Branch, but little work had been accomplished. 43/ There were, in addition, numerous requirements for routine PI reporting on such things as industrial plants, storage facilities, rail line and rail yard studies, and the like. The majority of these were levied by the ORR Economic Research Area and were assigned to the Geographic Branch.

4. Technical Support

During July and August 1956, technical support was focused primarily on matters pertaining to the exploitation of U-2 photography. In August 99% of all Technical Intelligence Branch project time was devoted to this type of work. 44/ Computations were made for grids for the tracker camera and for scale computations for the oblique cameras in the A-2 configuration. Technical Intelligence Branch personnel were also called upon to make critical measurements, particularly in connection with detailed photo analysis. One, among the earliest tasks, was undertaken to support the Army

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liaison group in their work on the Yo-Yo* guidance facilities at the Moscow SAM sites. 45/

The U-2 collection system was planned as an aerial reconnaissance system, though one that would yield a product of higher quality than any previously known. Since there was no experience factor, it was not possible to project either the volume or the scope of technical intelligence requirements that might be forthcoming, except in a very general way. Consequently, HTA was ill prepared to cope with the volume of requests for precision mensuration evoked by the excellent photography. Not only were analysts asking for more such measurements than they had ever seemed interested in previously, but some of the camera data needed to facilitate accomplishment of the mensuration tasks was also lacking. 46/

By August 1956, recognition of the dimensions of the problems ahead of TIB led to the establishment of two continuing projects to develop ways and means to adapt this reconnaissance photography to precise

* NPIC-2 (See p. 1, above), footnote p. 166, explains that the term "Yo-Yo" was applied because "the configuration of this radar reminded division [D/GP] photo analysts of a Yo-Yo."

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mathematical and geometrical manipulation. 47/ It was these developmental projects that provided a means for charging time that went into such activities as the exploratory work leading to the selection of a computer and preliminary planning for automating the mensuration readout.

5. Support Staff Activities

With but two experienced professionals for most of the summer of 1956, the Support Staff struggled to process a deluge of requirements and assign them to the branches. By the end of September, when statistics were first compiled, a total of 173 requirements had been received in HTA since its inception, 114 from ORR and 59 from OSI. Of this total, 143 were assigned or about to be assigned to the branches and 30 more were returned to the requester because of inadequate photo coverage and inadequate or incorrect background information. 48/ Certain others were challenged on the basis that the requirements were satisfied by reports done by the Air Force or the Navy. 49/

The Support Staff also maintained a heavy program of coordination, particularly with requesters about requirements. Conferences were held with representatives of other Offices, including [redacted] of OSI, and

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[redacted] of ORR, relative to

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the screening and levying of requirements. 50/

Though procurement of collateral photography, particularly World War II German coverage of targets of interest in the USSR and Satellites, was kept current with PI needs, the bigger job of expanding contacts with the several major sources of aerial photography in the Washington, D.C., area would have to await the arrival of additional personnel who were under recruitment. Moreover, the Support Staff and HTA were without an editor throughout the summer of 1956.

6. OCR Statistical Branch Charges Forward

From the beginning of operations in the Steuart Building, the OCR contingent vied with the PIs for recognition as a "can do" organization. Just as [redacted]

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[redacted] Director of the Office of Central Reference, had been forthcoming in designating some of his best people to staff the Statistical Branch, these same people now threw themselves with gusto into the task of supporting the ORR photo interpreters. Though it might be said that many of their actions bore the stamp of enlightened self interest, they also demonstrated unmistakably that the Statistical Branch would work in harmony with the ORR PIs and respond without reservation to Lundahl's leadership.

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Among Statistical Branch components, the Information Section, under Brugioni, was most intimately involved with the PI exploitation effort. Analysts in this section assembled the maps and charts for each mission and made them available to the PIs in the Special Projects Branch for use in plotting missions and in scanning photography. In addition, packets of collateral information -- documents, books, manuals, clippings, attache photographs, intellofax runs, and the like -- were provided not only to D/GP photo interpreters but also to those in the military liaison groups for background use in the preparation of all types of PI reports. 51/ During the first two months a major effort was made to work out procedures for bringing these materials and the expertise of the intelligence officers from OCR to bear on the job of exploiting the photography.

Classification and coding of PI reports emanating from or received by HTA for entry in the Minicard system* was begun in the summer of 1956, almost as soon as the reports were produced, even though Minicard processing

* For additional information on the Minicard system, see pp. 128-129, and its ultimate fate, pp. 337-338.

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equipment was not yet available. 52/ This task also was one of the functions of the Information Section.

The Technical Section, under [redacted] was a vital cog in the HTA operation from the outset. As far as the official T/O was concerned, this section consisted of two units, the photo lab and the Minicard. 53/ In reality, however, the Minicard unit was rendered inoperative for lack of equipment far beyond the summer of 1956 and personnel earmarked for it were used to extremely good advantage in the photo lab and to assist in the reproduction of publications. 54/ Without this opportune circumstance, it is difficult to imagine how the photo lab could have met its heavy commitments during these difficult early days.

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Not only was HTA dependent on the photo lab for the spectacular enlargements used on briefing boards, but PIs in the Steuart Building, whether attached to ORR or the Army liaison group, were also dependent on the lab for all kinds of special orders for photography to be used in their interpretations. In fact, the HTA photo lab was the source of all photography over and above the mission film and prints obtained on routine distribution from the processing site. When reports began to flow, the photo lab was also the producer of prints

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used as illustrations in early PI reports.

At this point in history, before PIs had turned to the use of positive transparencies, LogEtronic prints produced by the HTA photo lab were much in demand. The LogEtronic printer eliminated conventional methods of dodging* and constituted a real technical breakthrough. Through 31 August 1956, the lab produced 1,299 of these prints, nearly half of them for the Navy. 55/

During the summer of 1956, photo lab personnel demonstrated again and again that they were truly cast in the mold of the HTA elite. In spite of delays in receipt of equipment and inconveniences caused by its installation, the photo lab met its commitments. Even the potential impasse resulting from delays, due to the steel strike, in delivery of a large chiller unit -- for temperature controlled water -- and a dilution tank, was deftly averted when lab personnel got the facility into operation by improvising a temporary hookup of equipment. 56/

Though the reproduction function was officially recognized in the T/O as one belonging to the photo lab, it was quickly, though officially, treated as the responsibility of a separate unit of the Technical Section.

* For further information on "dodging" see p. 335, below.

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Doubtlessly, the inactive status of the Minicard unit invited this bit of improvisation. At any rate, re-production of the many different types of PI products soon became a very lively business. In July and August 1956 alone, more than 33,000 pages were duplicated. 57/

The huge task of controlling documents and classified materials of all kinds, including those within the TALENT system, as well as filing the film, disseminating HTA products, and providing courier services fell to the Support Section, under [redacted] possessor of one of the most flamboyant and uninhibited personalities in HTA. At the beginning, a Chevrolet carryall was purchased 58/ to carry classified materials between HTA and TALENT centers in the Agency and the Department of Defense. From 16 July 1956, armed couriers made two daily runs between the Steuart Building and these centers, leaving HTA at 0900 and 1400 hours. 59/

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7. [redacted] Task Force: Headquarters Outpost

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During the summer of 1956, the stay-behind unit, under [redacted] and known at that time as the "Task Force," still occupied space in Que Building and continued to carry on the traditional task of exploiting non-systems photography.

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Among the 17 Photographic Intelligence Memorandum issued at the SECRET level in July and August 1956, there was a crash report for OCI and ORR on MIG aircraft shipping crates at Chu-hsien airfield, in southeast China. 60/ Also, two projects for the DDP were completed and two publications relating to them issued: one, entitled "Project PEGMATITE," reported on the training of clandestine personnel in ground photography and in the analysis of aerial photography; 61/ the other was a memorandum, subject: "Amateur Photography from Commercial Aircraft." 62/ Information in the body of this eminently practical publication was prepared in such a manner that it could be separated and handled without security controls.

The Task Force under [redacted] was also involved in the evaluation of Clandestine Services reports using photography. In August 1956 information provided the Far East Division in DDP enabled a reporting officer to stop distribution of inaccurate reports on at least six occasions. 63/ [redacted] a former DDP case officer himself, was the leading proponent in the work on these so-called CS evaluations.

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8. Return from Europe

As the exploitation activity on the first eight operational missions was approaching a peak, Arthur C.

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Lundahl, chief of Project HTAUTOMAT, returned from Europe, on 2 August 1956. 64/ [redacted] chief, Technical Intelligence Branch, followed eight days later. 65/

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The main goal of both travelers had been the VIII International Congress of Photogrammetry held in Stockholm, Sweden, from 17 to 26 July 1956. Both spent several days in England prior to the Congress and a few to several days elsewhere on the Continent after it was over. 66/

At the Congress, Lundahl had an opportunity to renew many earlier acquaintances as well as meet many people he had never known, particularly in the Soviet delegation. When meeting the Russians, Lundahl was curious to see how they might react to an American in view of the recent penetrations of Soviet airspace by the U-2's, but they displayed not the slightest hint that they even knew of the incidents. On the contrary, they were very gracious to Lundahl and openly pleased to meet an American who could exchange the usual civilities with them in their mother tongue. 67/

Apart from the technical papers, which Lundahl and [redacted] were able to cover very well individually in spite of their being scheduled in concurrent sessions, the most important benefit to HTA from the Congress was the

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information gained from the wide range of photogrammetric equipment displayed by manufacturers from all over Europe. Several pieces of equipment of potential interest to HTA were either unobtainable in the United States or inferior in design or performance to those manufactured in Europe, particularly in Germany, Italy, and Switzerland. When the Congress was over [] and Lundahl shipped some 20 pounds of technical papers and brochures back to Washington, where it would be available in D/GP for future reference. 68/

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The post-Congress travel was mainly a follow-up on contacts made during the meetings, particularly to obtain more information about equipment potentially useful to HTA. Lundahl's sojourn on the Continent was brief. He visited the Zeiss plant in Munich, where he identified three instruments having immediate application to HTA work and assigned detailed follow-up investigation to [], and he established liaison with the TALENT Control Officer at USAFE Headquarters in Wiesbaden, Germany. 69/

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[] visit on the Continent was longer and covered more territory. After a stop at the Zeiss headquarters office in Munich, []

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[redacted] he visited the Ober-

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kochen plant and paid particular attention to the Radial Secator, a two-level slot cutter; the SEG V Rectifier, an autofocus rectifier for use with photographs up to 9 by 9 inches; and the Stereoplanigraph, a first-order, high-precision plotting instrument for use with vertical, oblique, or terrestrial photo pairs. 70/ Though Zeiss photogrammetric equipment was among the finest, it was primarily designed for mapping and ultimately proved to have but limited application to HTA needs.

Following his visit to the Zeiss Plant, [redacted] went on to Wild at Heerbrugg, Switzerland. At this factory he saw the VG 1 Enlarger, which was capable of producing essentially distortion-free 7X enlargements; the STK 1 Stereocomparator, a precision mensuration device so new that it was neither displayed nor mentioned at the Congress in Stockholm, and a great many smaller instruments used in the technical exploitation of photography. 71/ Wild equipment, particularly the VG 1 Enlarger, proved adaptable to HTA needs and several were procured later.

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[redacted] next stop was in Rome at the Ottico Mecanica Italiana plant headed by a former Italian Senator, Umberto Nistri. The dirt and disorder of this plant, as contrasted with the antiseptic cleanliness of the Zeiss and Wild plants, were almost overwhelming. Nevertheless, the Italians managed somehow to produce some very fine equipment which was noteworthy for the number and type of innovations featured. 72/ Among the instruments that [redacted] inspected were the Photostereograph Model Beta/2, a first-order, high-precision stereo plotter featuring electrically operated servo-motors instead of the usual hand cranks, a single "steering-wheel" guidance of the flotation mark, and a speed control lever analogous to the gearshift in an automobile. The Photocartograph Model V was similar in function to the Kelsh plotter that HTA had on order, but, again, it was operated by servo-motors. The Stereographometer Model 90 by Nistri was similar in capability to the Zeiss Stereotope but featured an unusual pantograph that yielded orthographic positioning of the plotted detail.

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In view of the innovative approach of Nistri designers and engineers, it is not surprising that HTA turned to this manufacturer when ordering the first automated, precision stereocomparator a few years later.

After the Congress, [redacted] also visited the Old Delft Instrument Co. and the International Training Center for Survey in the Netherlands. D/GP had earlier obtained one or more Old Delft scanning stereoscopes, and a pending contract was under negotiation by the Air Force for a number of 9-inch by 18-inch scanning stereoscopes for the benefit of both the Air Force and CIA. The International Training Center offered a wide variety of courses in five different fields of photo interpretation and photogrammetry and was widely regarded as the best in the world. Courses were open to students seeking no degree at all or degrees up through the doctorate.

[redacted] strongly urged consideration be given to sending a limited number of HTA personnel to the Training Center, as work loads might permit. 74/ In later years, HTA successor organizations did, in fact, send several trainees to this school.

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[redacted] and also execute an 25X1

errand for Bissell. [redacted] spent his time in England 25X1

visiting the Williamson Manufacturing Co., Ltd., where

he examined several aerial cameras in production, and

the Royal Aircraft establishment at Farnborough, where

he met personnel in the night photography department. 75/

At this point in time [redacted] and some of his coworkers 25X1

were already deeply involved in support to Project

OSTIARY, the night photography system under develop-

ment by DDP.

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Lundahl's return to the United States on 2 August projected him into a maelstrom of activity. The discoveries resulting from the photographs taken on the first eight missions were still red hot news, the move into the Steuart Building was still recent enough to invite expressions of concern from above and generate problems from below, and, in spite of the initial successes in coping with the work, there were lingering apprehensions that something could still go wrong. By the middle of the month Lundahl was getting his feet on the ground and settling down to a steady round of briefings

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with senior CIA officials. 78/ A pattern was emerging that would provide Lundahl and HTA and its products excellent exposure before important decision makers. And both were destined to take full advantage of the opportunity. But, first, there would be some last minute changes in the script.

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II. The Middle East Crisis

Just as HTA was settling down after the move into the Steuart Building and the best show in the Community appeared to be headed for a long and successful run, the USSR lost its major supporting role to a pushy little upstart. In retaliation for the decision by Western nations to withdraw offers to help finance the Nile River project, Egyptian President Nasser on 26 July 1956 proclaimed the nationalization of the Suez Canal Company. 79/ Following this announcement, relations between Egypt on the one hand, and Israel, France, and England on the other, deteriorated rapidly. The United States, with whom the three Western powers in the dispute were less than forthright, needed good intelligence on events that might lead to some kind of military action.

A. U-2's Assume a Tactical Role

At a time when U-2 photography of the Soviet Union had captivated the attention of those in the highest echelons of government, at least one solution to the problem of obtaining information was obvious. The U-2, which had been conceived as a high-flying strategic

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reconnaissance vehicle, would now be used in a tactical role, albeit still a passive and surreptitious one.

At least until such time as hostilities might erupt, it would seek indications of military preparations, and, in particular, evidence of any dramatic increase in British or French forces in the area. It would monitor ship movements in harbors such as Toulon, Valetta, and Rhodi; aircraft deployment in Cyprus, Israel, and Egypt; and troop concentrations and military installations in Cyprus, Israel, and Egypt. 80/

Once the decision was made, no time was lost in initiating the surveillance, even though some of the more distant areas of interest in the Middle East were beyond reach of U-2's based in Germany. The first two missions were flown on 29 August and covered parts of Egypt, Libya, Syria, Lebanon, Jordan and Israel. 81/ Two more followed the next day and repeated coverage of the same countries. 82/ When flights took off from Incirlik Air Base, at Adana, Turkey, in September, the entire Middle East was brought within easy flying range and increased substantially the time available over target areas.

As the fall wore on, it became apparent that a serious crisis was brewing. Consequently, the number of

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missions flown increased in September and again in October. When the 10-day war finally broke out on 29 October, 83/ U-2 reconnaissance was used to provide information on the course of military events. Aerial reconnaissance reached a peak in November when 14 missions were flown, all out of Adana. Following the 7 November cease fire, 84/ U-2 photography provided information for damage assessment, for identification of refuges used by fleeing Egyptian aircraft, for pinpointing acts of sabotage, and for surveillance of other possible military buildups in the area. 85/

B. HTA and the PARAMOUNT Committee

The need of policymakers and the White House was for finished intelligence based on all available sources. HTAUTOMAT had the only capability in the Agency for adequately exploiting U-2 photography, but lacked the expertise and broadly based representation to do the all-source evaluation. The problem was solved on 12 September 1956, when the Intelligence Advisory Committee (IAC) created the PARAMOUNT Committee to handle the all-source reporting. 86/

The committee was chaired by Frederick A. (Fritz) Voigt and included representatives from CIA, Air Force,

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Army, Navy, NSA, and Department of State. 87/ Among the CIA representatives was Enno H. (Hank) Knoche, who functioned as executive secretary. Bringing the expertise of HTA photo interpreters to bear on the work of the committee and providing secure handling of TALENT system materials were accomplished with a single stroke: the committee would meet in the Steuart Building.

Pursuant to this decision, a specially cleared and secured room thenceforth called the PARAMOUNT room, was provided on the seventh floor of the Steuart Building, in the Special Projects Branch work area. Here HTAUTOMAT photo interpreters and collateral support specialists serving in an advisory capacity attended all committee meetings, along with the regular members. In addition, one or more PIs were customarily posted outside the door of the PARAMOUNT room, where they were available to respond immediately to spot requests for information supposedly available from the photography. HTA also provided support to the committee in compilation of a comprehensive list of requirements for photo-based information; in the preparation of numerous graphics; and in the typing, reproduction, and dissemination of committee materials and reports.

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Since the PARAMOUNT Committee would be working in the field of indications intelligence, it was imperative that the information available be as current as possible. Whereas information other than photography could be made available in a matter of hours, that from U-2 photography would be many days old if it followed established handling procedures, which called for processing at the Eastman Kodak plant in Rochester, N.Y. Something had to be done to speed up PI reporting. The obvious solution was to process the film and read it out at, or close to, the base of operations and cable the information to Washington.

On 12 September 1956, the same day the IAC established the PARAMOUNT Committee, Lundahl and James Q. Reber, the latter in his capacity as CIA TALENT Control Officer, arrived in Frankfurt, Germany. 88/

 the chief of SPB, had departed Washington for Wiesbaden two days earlier, 89/ and was there when Lundahl and Reber arrived in Frankfurt. 90/ Negotiations were carried on at two levels. Policy matters and arrangements were discussed with the Commander in Chief, US Army, Europe, and the Commander in Chief, US Air Force, Europe, both of whom, with their intelligence chiefs, were briefed by Reber. Technical and procedural problems

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involved in the development, duplication, and exploitation of the photography were discussed with service liaison officers and personnel already present, as well as with [redacted] 91/

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Equipment was judged inadequate. It was reluctantly, if somewhat hopefully, decided that [redacted]

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[redacted], chief of the HTA photo lab, working with their Air Force counterparts, could jury-rig a lab facility that would admit of processing the film at the base, without an unacceptably high risk that it would be irreparably damaged. A major concern was to ensure beyond reasonable doubt that processing the original negative in the field would not significantly degrade it for future, more exacting, exploitation in Washington. 92/

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Security was another worrisome problem. [redacted]

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[redacted] the CIA/HTA TALENT security officer, participated in the survey of facilities from this point of view. Conditions were far from ideal and required substantial improvement to permit the handling of TALENT system materials. Not only did physical facilities and equipment require upgrading, but better control had to be exercised over foreign nationals employed on the base in areas where codeword system materials were to be handled. 93/ More difficult to cope with were the

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potential hazards presented by the Valhalla, a local night spot favored by base personnel. Though no security problems involving HTA personnel at the Valhalla ever arose, the vulnerability to Communist blackmail of the unattached females who frequented the place was a source of continuing concern to those responsible for safeguarding knowledge of TALENT operations.

Deliberations concerning the organization, who should be in charge, and the staffing were not immediately conclusive. The Air Force, having lost the controlling interest in the U-2 program, was understandably reluctant to acquiesce to any proposal that overseas processing and interpretation centers be managed by HTA personnel. Yet, initially, HTA possessed the technical expertise needed to establish and operate the centers. The political climate was, thus, less than favorable for initiating operations, but the Middle East crisis couldn't be halted until this problem was resolved.

With an egotistical perfectionist like [redacted] as the senior HTA representative, the undertaking was predictably a stormy but successful one. It was not until the end of October that the thorny question of who would give the orders was settled by a CIA-Air Force agreement. The Air Force would henceforth name the

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commanding officer. His deputy, for technical and substantive intelligence matters only, would be designated by CIA. 94/ Instead of running the show, [redacted] became the deputy to [redacted]

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Assignment of HTA photo interpreters on normal 90-day tours of duty was begun just a few days after [redacted] departed in September. First to go were [redacted] [redacted] who had long been identified with the U-2 program, and [redacted] a more recent recruit. 95/ Both were on the Special Projects Branch, T/O.

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Strong support was provided by the Statistical Branch, OCR, in supplying reference materials and in setting up the photo lab. Prior to the departure of the first group of PIs, a sizeable number of reference materials were assembled to accompany the team. 96/ The Chief of the Photo Lab, [redacted] spent some time in Germany assisting in the setting up and activation of the processing facility.

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Later, fast moving developments called for an augmentation in the number of HTA photo interpreters overseas. At the same time, with the shift of Middle East operations from Germany to Turkey, the PIs in Germany were scarcely better situated to provide current information to the PARAMOUNT Committee than they had been

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at the outset, when the base of operations was in Germany and they were in Washington. On 19 November 1956, at a special meeting attended by [redacted]

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Bissell, Reber, [redacted] Lundahl,

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and others, the decision was made to establish a second processing and interpretation center on Adana AFB and shift the PIs to Turkey. 97/

In response to these evolving requirements, nine more PIs were sent overseas by the end of November,* three from each of the three PI branches; one returned. 98/

The Statistical Branch also responded with an October shipment of three crates containing over 1,350 reference

items. 99/ In addition, [redacted] once again found

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himself reluctantly overseas, this time in Adana for Thanksgiving, scrounging construction materials and overseeing Turkish carpenters equipped with simple tools like the saw, adz, and knife, construct counters, shelves, and sink stands to measurements and mitering gauged by the eyeball. 100/ Further assistance as well as moral

* It is not practicable to indicate the place of assignment of each PI. Suffice to note that most spent at least part of the time at both bases, and there was some short-term rotation between bases. Spartan conditions, including lack of attractive off-base recreational facilities, made assignment in Adana too confining to satisfy typically venturesome personnel.

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support was provided by [redacted]

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deputy chief, Statistical Branch, and [redacted]

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[redacted] a special assistant occupying an IAC

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slot in Lundahl's office. Both of the latter were sent overseas to troubleshoot the inevitable problems and to procure lab equipment. In spite of animated efforts by HTA personnel to get the Adana facility into operation during November, it was a month later, thanks to a lack of photo processing materials, before the first mission was read out by HTA and service PIs on the base. By that time the Middle East crisis of 1956 was virtually over.

C. Functioning of the PARAMOUNT Committee

PARAMOUNT Committee inputs consisted of three types of material: information derived from U-2 coverage of the Middle East and Mediterranean; [redacted]

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[redacted]
[redacted]

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Committee members were on 24-hour standby duty.

Whenever a new cable arrived, the committee convened again, sometimes for the third or fourth time in a single day and at any time of the day or night. 102/ Facilities and support at HTA were also available on an around-the-clock basis. By 13 November when the IAC deactivated the committee, there had been 64 meetings; 63 reports and 13 supplements had been issued. 103/

With a PI complement that did not exceed 50, including supervisors, at any time during the fall of 1956, work at Headquarters and overseas in support of the PARAMOUNT Committee constituted a substantial diversion of manpower from other tasks. In the Special Projects Branch, the group most directly involved in the operation, nearly 50% of all man-hours worked in the months of September through November 1956 were charged to the project established to support intelligence activities related to the PARAMOUNT Committee. 104/ The two detailed-reporting PI branches also felt the pinch of

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crisis work. In October, the Geographic Branch predicted a drastic decline in production in the next few months, and gave as one reason the overseas assignment of one of its PIs, [redacted]

105/ A month later

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the same branch noted that production had in fact declined and ascribed it in part to the continued absence of [redacted] overseas and to the departure, during November, of both [redacted] for similar duty. 106/

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Though the Industrial Branch also had three PIs overseas by November, its plaint was couched in different terms. Both the October and November IB monthly reports claimed that branch problems arose mainly from "lack of personnel." 107/

The work of the PARAMOUNT Committee, with a big assist from HTA, was a great success. The Watch Committee and the President were kept well posted on the military buildup and had advance warning about the impending military action. In just a matter of months, HTA had again scored high marks for its resourcefulness and accomplishments.

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E. HTA Continues Work on the First Eight Missions

In spite of the extraordinary effort in support of the PARAMOUNT Committee, HTA continued detailed exploitation work begun but not completed during the summer. New projects were also established in response to requirements received during the fall, and work on them was undertaken as time and staffing permitted.

The Geographic Branch turned out a steady stream of conventional plant studies plus a scattering of other publications dealing with such subjects as rail yards, train movements, and new highway and powerline construction. Most of these were briefs and all were

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indistinguishable in format and mode of presentation from those of a few months earlier. Though of minor importance from a national point of view, they did provide ORR analysts with a continuing flow of information in response to their requests.

The Industrial Branch, on the other hand, was pre-occupied with a more limited volume of military and scientific reporting of much higher interest and of greater significance to national security. Because this work was more analytical in nature and dealt largely with imperfectly understood and previously unknown facilities, progress in reporting was slow. On 7 September, a PI Alert was issued to inform the Intelligence Community that the unidentified installation under construction near Mozhaysk might be for nuclear reactors. 113/ Nothing further was issued during the fall on this perplexing riddle. On 21 September, another Alert was issued, again on the basis of July photography, calling attention to a pair of large circular pads on a bluff overlooking the Black Sea, just south of Sevastopol. The Alert speculated, with some success, that this installation was probably for the flight testing of missiles. 114/ Throughout the fall work continued on the analysis of two different types of special weapons

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storage and loading facilities at Soviet long-range bomber bases. Though discovery of these had excited the Community during early weeks of the summer, November passed without the issuance of a formal publication.

F. A Stirring Giant

Though Lundahl arrived in CIA with a keen interest in research and development and with a head full of fresh ideas, the organizational climate and the exploitation requirements were hardly conducive to big thinking. The advent of Project AQUATONE,* however, not only invited but demanded sharply increased R&D activity. Nor was it merely a question, and a very challenging one at that, of shifting into a higher gear. The heavy cloak of secrecy surrounding AQUATONE severely restricted the options for organizing the effort and staffing to get the job done. The short-term solution was an ad hoc one, with [redacted] and his small task force doing much of the early work, and with [redacted] and others cleared in only as evolving developments permitted. As a result of this pragmatic approach, research and development had no well

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* For the creation of Project AQUATONE see NPIC-2, footnote p. 1, above, p. 112.

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defined home even after Project HTAUTOMAT came into being in the summer of 1956.

Though it was to be some years before an independent component would be charged exclusively with responsibility for research and development, the locus of such activity in the fall of 1956 began to shift from

[redacted] and SPB to [redacted] and TIB. At the same time,

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Lundahl's high personal interest and guiding hand in R&D were retained and augmented in the person of [redacted]

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[redacted] who spent most of his time on these matters and operated out of the office of the division chief.

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Interestingly enough, the stirring that took place in the fall of 1956 stemmed only in part from Project AQUATONE. October of that year was the first in a succession of months during which more than 40% of all project time logged in the Technical Intelligence Branch was charged against two DDP projects. Only a minor part of the effort was devoted to augmenting the existing capability to exploit TALENT photography.

One of the two DDP projects was calibration of the MM 50 surveying camera, an instrument that had been produced for the Clandestine Services by Photogrammetry, Inc., of Silver Spring, Maryland. In its development,

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the Photo Intelligence Division had provided technical support to DDP as well as some liaison with the manufacturer. This instrument was the first photo theodolite ever made in America (Figure 8). It was designed to establish latitude and longitude to five arc seconds, and azimuths to two arc seconds.

Now, in the fall of 1956, D/GP was called upon to calibrate the camera. The task, to which

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fell heir, was a demanding one, particularly with respect to the amount of computation involved. The theodolite utilized a technique of stellar observation developed by [redacted] of Photogrammetry, Inc., where-
by direct and reverse observations could be made of the zenith without disturbing the level bubbles. Each exposure -- and the direct and reverse images were double exposed on the same frame of photography -- provided data for several dozen observational equations. These were reduced to the normal to solve for the directional cosines of the true zenith, which could be determined to five arc seconds. Though weather caused some delays in taking observations, they were completed in three or four nights. Hand reduction of the data, however, took approximately two months.

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The second of the two DDP projects, though not as demanding of time in the fall of 1956 as work on the MM 50 surveying camera, had much more serious long-range implications. It involved Project OSTIARY, a DDP undertaking to equip the P2V-7U aircraft for taking low-level night photography over denied areas.

The Photo Intelligence Division had been introduced to the project early in 1956 when TIB representatives had been asked by [redacted] of DDP/FI to make recommendations concerning a camera system for the project. 115/ An abortive recommendation followed. 116/ By the end of March, D/GP involvement grew to a point where [redacted] were participating with DDP representatives in negotiations with the camera manufacturer. At this late date, they discovered that the amount of light available for photographic exposures would be on the order of only two lumens per square meter. A revised camera recommendation, the one finally adopted, followed on the spot. It was made as a sort of last resort, and with full realization that the available light was very probably submarginal at best. 117/

The system envisaged would utilize a P2V-7U aircraft manufactured by Lockheed, a CAX-12 camera manufactured by Fairchild, a camera mount produced by Aeroflex

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Laboratories, lenses fabricated by the Grimes Manufacturing Co., and lighting equipment by Air Research, a subsidiary of the Garrett Corp. Lockheed would be the prime contractor. 118/

During the summer and fall of 1956, TIB personnel, chiefly [redacted] participated very actively with DDP representatives in monitoring progress in the fabrication of the several component parts of the camera system and in providing technical guidance to the contractors. By the end of October, the photographic system had been tested at the Fairchild and Aeroflex plants and accepted for delivery to Lockheed and installation in the aircraft. 119/ A month later, [redacted] made a trip to the air proving ground at Eglin Air Force Base, Florida, to participate in the formulation of a program to field test the photographic system. This completed plans for the test flights which were scheduled to begin the latter part of January. 120/

The lesser part of the TIB research and development effort during the fall of 1956 was devoted to the exploitation of TALENT photography and involved a consideration of alternatives for solving photogrammetric computational problems. As early as September, Lundahl and [redacted] called these mounting problems to the attention

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[redacted] and Bissell. It was hoped that the latter might be able to offer some assistance in the form of project funds to help in their solution. 121/

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Basically, the problems stemmed from the fact that the unique nature of TALENT photography rendered inadequate many of the orthodox photogrammetric solutions then used in the metrical exploitation of aerial photography. In his memo, [redacted] suggested three alternatives: 1) early acquisition of more photogrammetrists, 2) contracting some of the extensive computations to private industry; and 3) lease or purchase by D/GP of a small digital computer. 122/

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The first alternative was deemed impractical because of the scarcity of trained photogrammetrists and the long lead time that would be needed to get them on board. With a T/O of seven professionals, the branch was already experiencing great difficulty in filling the three remaining vacancies. The second alternative offered some attractions. At least one firm, Spica, Inc.,* had a computer and had personnel cleared for

[redacted]
He was a member of the CIA Scientific Advisory Board and had been intimately involved in the design of the B camera for the AQUATONE collection system. The performance of the B camera is described pp. 124 and 263, below.

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handling the data. 123/ Adoption of this alternative would provide a relatively simple solution to short-term computational problems without committing D/GP to the lease or purchase of a computer. The third alternative, though extremely desirable, was generally judged to be beyond the grasp of D/GP, primarily, because of cost. Nevertheless, its attractions were such that [redacted] authorized [redacted] who initially suggested this solution, to investigate the range of computer capability required to satisfy D/GP computational requirements, and to determine which, if any, of the small computers then just coming on the market would satisfy those needs. 124/ It was this matter of computers that engaged a considerable amount of [redacted] attention during the fall of 1956.

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In addition to defining the scope of computations involved in D/GP work, [redacted] investigations included the examination of brochures issued by manufacturing firms and attendance at conferences and expositions.

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During the fall of 1956, [redacted] made at least three trips to New York, where he heard papers, viewed exhibits, and participated in "clinics" devoted to discussions of specific pieces of equipment on display. 125/ At the suggestion of [redacted] also established contact with [redacted]

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[redacted] of the Management Staff, who provided some assistance in establishing contacts with manufacturers representatives and with computer users in the Washington area. 126/ Though no serious attempt was made to order a computer, the spadework done by [redacted] at this time provided basic terms of reference that could be used, with a minimum of updating, by D/GP to capitalize on any unexpected opportunity to procure one.

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Thus it was that in the fall of 1956, of four professionals in the Technical Intelligence Branch, two were heavily engaged in support of DDP research-and-development activities, and a third was spending a significant amount of his time on questions related to the possible procurement by D/GP of a digital computer. This left only one man, [redacted], more or less free of other commitments to provide mensuration support for photo interpretation projects. The burden of R&D work was definitely shifting to the Technical Intelligence Branch.

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G. PI Training

During the first few hectic months of HTA operations, photo interpreters were given virtually no training, technical or otherwise. Nor had D/GP been able to justify a resumption of the in-house course in photo

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interpretation which had been offered several times during the previous year. It had already become apparent, however, that short-run improvisation to respond to new situations and to answer requirements could not be justified as a continuing method of operation at the expense of the professional growth and development of the very people on whom the success of the operation depended.

The influx of new recruits which had assumed large proportions in the spring of 1956 and continued into the summer and fall of that year had included many young PIs with limited experience. Though possessed of a basic competence in PI, their training and experience were such as to admit of room for further development of their basic skills. The plan adopted at this time was to send these junior PIs, a few at a time, to the first half of a course given at the Navy Photo Interpretation Center, Anacostia. Following some initial difficulties posed by the request for training at a non-CIA facility, 127/ two PIs --

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-- were enrolled in the course

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beginning 19 November 1956 and ending 1 February 1957. 128/ These two were but the first of a number of professionals who took this course over the next few years.

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The fall of 1956 also marked a brief resumption of the D/GP course in Basic Industrial Photographic Interpretation. The ninth presentation, which was given in the new Central Building quarters of [redacted] "Task Force," began on 30 October. 129/ When this offering of the course was completed in December, further presentations were again temporarily suspended because of the pressure of other work. 130/

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H. Looking Back

HTAUTOMAT instituted operations in the Steuart Building in July 1956 with confidence, but with the expectation of a challenging and exciting future. And no one was disappointed. The Middle East crisis had even added a new dimension and further demands beyond those expected from the exploitation of TALENT coverage of the USSR.

Now, late in the fall of 1956, though the momentum of the Middle East crisis was still producing ground swells resulting from the imminent establishment and activation of the film processing and photo interpretation center at Adana AFB, Turkey, the generation of new demands seemed to have subsided. HTA had confronted and succeeded in the initial exploitation of the Russian

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penetration missions. Then, in the ensuing months, there had been no more such coverage. Lundahl and [redacted] had returned from their TDY in Europe with enough information on the latest exploitation equipment fabricated by European manufacturers to satisfy most of the immediate needs not capable of being met by the products of domestic manufacturers. The unexpected test of the Middle East crisis had been faced and passed with flying colors. Overseas processing and interpretation sites had been established. Even though the struggle to manage them had been won by the Air Force, HTA had the satisfaction of knowing that it was they who had set them up and would pass them on to their new managers in operating condition. [redacted]

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Though it could only be regarded as a figure of speech to say that things were about to return to normal, when no norm had yet been established for such an unprecedented operation, things were beginning to calm down. There would be a respite from the repeated call for immediate reaction to a succession of crises and problems. There would be time to reflect on internal operations and to initiate constructive action.

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III. Back on Course

By December 1956 HTA operations were reverting to what might be regarded as a more normal condition and changes were instituted to adjust to the new circumstances. First and foremost was the status of detailed reporting, particularly in the Industrial Branch. Though many publications had been issued during the summer and fall, the majority were one-page briefs. Indeed, the first HTA Photo Intelligence Report was yet to be issued. There had been, for example, no detailed reporting on the Soviet long-range bomber bases. Though PI Alerts had called attention to the installation near Mozhaysk and the supposed missile-launching site south of Sevastopol, further written details were lacking. When new photographic inputs arrived, when a world crisis loomed, or when higher authority levied a new requirement, the manpower needed to provide a typically expeditious HTA response had been provided at the expense of detailed reporting. Moreover, in-depth reporting on exotic military and scientific installations and equipment was further hampered by lack of expertise both inside and

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outside HTA. Nevertheless, relaxation of the dizzy pace set during the summer and fall was bound to improve the milieu for detailed reporting, even if it didn't automatically solve all the procedural and substantive problems.

There were other potential beneficiaries of the easing crises. HTA had experienced a meteoric rise in importance. There was as yet, however, no tangible expression of just what had been accomplished. If intelligent plans were to be made for the future, the first step would be to assess accomplishments of the recent past.

The continuing stand-down in deep Russian penetration flights was proving to be a mixed blessing. It had given HTA a chance to cope with the ramifications of the Middle East crisis without fighting for its existence on a second front. It also afforded the Technical Intelligence Branch, which largely escaped involvement in the Middle East crisis, an opportunity to proceed with plans for testing photographic components for the P2V night reconnaissance system. At the same time, the suspension of missions over the USSR, coupled with the fading Middle East crisis, was about to create severe internal problems relative to the level of staffing

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in the Special Projects Branch and the means used to keep personnel in that component busy.

One reminder of the heady experiences of the fall, when the Middle East crisis held sway, was the continuing overseas commitment that resulted from the activation of the processing and interpretation center at Adana and its orderly transfer to Air Force control. Moreover, the Wiesbaden facility would need time to adjust to the shift of collection and exploitation activity to the Middle East. Thus, several months would pass before most of the PIs assigned overseas returned to their regular Headquarters assignments.

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B. Organizational Incongruity

The easing of the Middle East crisis was felt more

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rapidly at home than it was in the field. Whereas the backup scanning of Middle East missions had kept state-side members of the Special Projects Branch very busy during the crisis, the waning of mission activity was marked by a declining work load. This situation was aggravated by the continuing stand-down in deep penetrations of the USSR.* In a branch initially staffed to handle voluminous inputs, other work had to be found.

The decline in mission exploitation activity and the consequent search for other work brought into play another very significant factor. Even at this early date, it was apparent that mission scanning was a deadly business. Not only was the routine scanning of hundreds of feet of film day after day a tedious task, it was also one offering little opportunity to maintain and improve the technical capability of the PIs assigned to the job. To a man, photo interpreters worth their salt longed for the opportunity to do work that would challenge them and improve their PI skills.

It is not surprising, therefore, that one solution chosen should have been detailed or summary-type reporting.

* Between 10 July 1956 and 19 June 1957 only one U-2 mission penetrated Russian airspace. Mission 4016, flown out of Adana on 20 November 1956, reached Baku and covered parts of the Caucasus region. 135/

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The first such project undertaken by SPB was an investigation of Soviet and Satellite ammunition and unidentified storage installations having both maximum security and some form of blast protection. In response to requirements from OSI and OCI, 136/ three SPB photo interpreters undertook work on this project, under the leadership of [redacted] on 3 December 1956. 137/

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By the time the study was completed and the results published in the summer of 1957, the report covered 87 installations and had an appendix identifying 72 others which met only some of the stated criteria. 138/

Projects such as this met the objections raised by ambitious PIs who desired work more challenging than routine scanning. It also provided productive employment between missions. On the other hand, it invited questions as to why SPB should continue to be the largest PI branch at a time when the two detailed-reporting branches were struggling under heavy backlogs of work. Though it was premature to expect any showdown at this time, the dimensions of the problem were destined to grow to critical proportions by the following summer.

C. Briefing-Aid Books

In December 1956, Lundahl, [redacted] and Brugioni met to plan a set of books for use in briefing high-level

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government officials inside and outside the Agency on the accomplishments of HTA during the first six months of its existence. 139/ Such briefings would be useful in summing up at one time and place the succession of achievements to which many such officials had been exposed in piecemeal fashion. The briefing-aid books would also be useful in justifying continued support of HTA operation. Internally, the information compiled would serve to sum up and quantify HTA accomplishments and to provide a point of departure for planning over the next several months.

The first planning session was followed almost immediately by a second meeting to develop working details. The latter meeting was attended by [redacted] under whose general direction the work would be accomplished; Brugioni, under whose direction much of the compilation and writing would be done; and [redacted] who would be the focal point for providing information on PI material to be included. 25X1 25X1

Six books were originally planned, but only four were completed: one book gave a statistical summation of U-2 inputs and of HTA products and accomplishments, another was directed to HTA work on the Middle East crisis, and two examined the results of the first eight

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missions over the USSR and Satellites. Work was begun almost immediately on the first of the USSR books. 140/

Measuring 20 by 19 inches, these books were an impressive example of institutional advertising and a demonstration of the alertness and aggressiveness with which HTA capitalized on its opportunities. Photographs were all glossy prints, many of them page-size save for the space needed for titles, captions, and small inset maps. Lettering, including the text was done with a Leroy guide, providing large, easy-to-read material. All reproduction, including text, was done photographically, with successive pages dry-mounted back to back.

The product that resulted was extremely attractive and had great visual impact. Produced at first in a few copies for desktop briefings of a few key officials, the volumes almost immediately became a prestige item, and many additional copies had to be produced to satisfy the demand.

Production work on these books was largely a graphics job, done in the Special Projects Branch. From December 1956 through March 1957, 50% of all the time logged in the branch on graphics jobs was charged to this project. 141/ Indeed, 10% of all SPB time,

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including that spent on graphics, was so charged. As in the case of summary-type projects like the one on secure storage areas in the USSR and Satellites, the availability of so much time, albeit much of it overtime, for a project not directly concerned with the immediate reporting responsibilities of the branch highlighted the broad gauge functions assumed by the branch and raised additional questions, particularly in the minds of those in the two detailed-reporting divisions, concerning the high level of staffing in SPB.

Notwithstanding the obvious questions of cost and manpower utilization, these books constituted the most impressive historical record of any series of episodes in the history of NPIC or any of its predecessor organizations. They were used by Lundahl to brief key Agency officials, including the DCI, Allen Dulles, as well as high-ranking military officers. They are also reported to have been used to brief selected members of Congress.

D. Soviet Long-Range Airfields

The winter of 1956-57 marked the first noteworthy reporting by HTA on Soviet SAC-type airbases covered by U-2 photography the previous July. In part, this delay

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was caused by the generally high level of first- and second-phase exploitation at HTA and, more specifically, the diversion of PI effort in support of the Middle East crisis both at Headquarters and at overseas sites. It was also a reflection of the lack of knowledge by the PIs and by intelligence analysts in general of Russian offensive weapons and airborne delivery systems. Two milestone reports on this subject were issued in the form of PI memorandums, one in December 1956 and the other less than three months later. Both were products of the Industrial Branch.

The first of the two was entitled, "Probable Special Weapons Storage and Loading Installations," dealt with facilities at Baranovichi, Bobruysk, Bykhov, Orsha, and Siauliai Airfields. 142/ The weapons storage areas associated with these airfields were located four-to-six miles away. Hard-surfaced roads connected the airfields and storage areas. The weapons loading areas were adjacent to the airfields and served by taxiways from the runways (Figure 9). When these airfields were photographed in July 1956, all were in varying stages of construction, suggesting that they were to utilize a newly developed or recently modified weapons system.

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The second of the two publications, also a PI memorandum entitled, "Special Weapons Loading and Storage Installations (Stryy Type)" 143/ dealt with facilities at Karankut, Minsk/Machulische, Soltsy, and Stryy Airfields. At these fields both the storage and the loading facilities were situated adjacent to the airfields (Figure 10). All were complete at the time of photo coverage in July 1956.

The obvious evolution that had taken place in PI confidence and capability in a period of less than three months was indicative of the learning process in which PIs in the Industrial Branch were engaged. The first memorandum spoke of "probable" special weapons storage and loading installations. In the second, no qualifier was used. Moreover, in the second, the qualifier was dropped in alluding to sites covered in the earlier publication. Similarly, by the time of the second publication, the differences between the two types of sites had been recognized as significant enough to merit the application of special designators. The group treated in the February memorandum was called the Stryy type; those reported in December were belatedly dubbed the Orsha type.

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Though the precise function of the facilities was not definitely settled at this time, it was believed that they were used to store and load [redacted]

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airborne missiles because of their design and construction as well as the heavy security associated with them.

The loading pits at the newer Orsha-type facilities and the largest one of four at each of the older Stryy-type sites were of similar size. They were thought intended for use by large aircraft, such as the Badger.

The smaller pits at the Stryy-type were believed to be for servicing smaller aircraft like the Beagle. Interestingly, details of the loading pit configuration and widths of the loading ramps and taxiways at both sites, as revealed by U-2 photography, raised serious doubt whether they could be used by Bison's, with their main landing gear directly below the fuselage and with outriggers extending from the wingtips.

Neither of these types of Soviet loading and storage installations was previously known to US intelligence. At a time when intercontinental missiles were still in the R&D stage and airborne systems for the delivery of nuclear weapons were the immediate threat, this information was of high intelligence interest. Quite apart from the information itself, these reports

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helped further to dramatize the unique capability of the U-2 and interpreters of U-2 photography to breach the curtain of Soviet secrecy and spread before US planners and decision makers painstakingly detailed information concerning some of the most closely guarded Russian military installations.

E. Mozhaysk

Determination of the purpose and functioning of the perplexing installation under construction near Mozhaysk, USSR, was a much more difficult task than reporting on the long-range airfields. Interest in this installation rose sharply during the winter of 1956-57 in those quarters of the Intelligence Community witting of the TALENT coverage.

The installation was located in rural surroundings, about 75 miles west-southwest of Moscow (Figure 11). Within the site, which covered about three square miles, attention was centered on a large earth-covered dome 190 feet in diameter and 85 feet high, with a cap on top

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(Figure 12). A second structure, the mirror image of the first, was situated one kilometer to the north (Figure 13). This second one was still under construction at the time of photography, revealing, among other internal

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details, a vertical shaft [redacted] under the position of the cap in the earth-covered dome (Figure 14). 25X1

The operational part of the site contained many other buildings, some with massive walls up to 10 feet thick. Four major structures were buried or about to be buried to a depth of 20 feet or more (Figure 15).

The entire site was surrounded by a double fence separated by a cleared strip 10 feet wide. Access was limited to one entrance provided with a guard post. All housing, which, it was estimated, would accommodate up to a few thousand persons, was within the security fence, but separated by another fence from the operational area. Some 10 miles of hard-surfaced roads with wide-angle turns connected the housing areas and facilities within the operational area. Many of the latter were individually fenced.

Access from the outside was by first-class road; there was no direct rail service. There was likewise no evidence of unusually large sources of water or electricity, or of large-capacity facilities to dissipate heat from industrial processes. 144/

On 20 December 1956, the Assistant to the DDI for Planning sent a memo to the Army, Navy, and Air Force designating 3 January 1957 as the date for the first

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general meeting on the Mozhaysk problem. On the latter date, 49 persons, about half from the military services and half from CIA, plus three from NSA and two from the AEC, met at the Steuart Building. Four days later, on 7 January, a second general meeting attended by 30 persons representing the same organizations was also held at HTA. On 9 January, HTA received a new requirement from OSI/GMD to study the Mozhaysk installation. 145/

During the next week military intelligence and Agency personnel briefed USAF, US Army, and USN consultants on the installation and sought their uninhibited speculations about its possible uses. 146/ Persons briefed included Dr. Werner von Braun, Dr. Herbert York, Dr. Edward Teller, Dr. Mark Mills, Dr. Louis Alvarez, and Rear Admiral Hyman Rickover. During the same period, OSI representatives briefed [redacted]

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[redacted] then serving as consultants to that Office. The eminence of the scientists involved and the dispatch with which the Army, Air Force, Navy, and CIA arranged and accomplished the briefings emphasized the importance that the Intelligence Community attached to the problem.

The insights and ideas obtained from this series of interviews were stimulating, even foreboding, but

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bore little resemblance to the final solution. Von Braun thought the installation might be intended to launch long-range nuclear-powered missiles. Teller and Mills also entertained the same idea, but regarded its probability as being no higher than 10%. Alvarez also speculated that it might be for launching ICBM's, but conventionally powered ones. He ruled out the use of nuclear power because of the radiation hazard to which the large housing area, less than a mile away, would be exposed. Rickover confined his comments to possible nuclear applications of the site. He ruled out consideration of the facility as a nuclear-fueled electrical power plant for lack of cooling towers or apparent sources of water, but he seemed intrigued by the possibility that it might be used for testing of nuclear equipment, including nuclear rocket propulsion motors.

[redacted] speculated more

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cautiously. They discounted the possibility that the site might be for launching missiles, but suggested that it was probably related to the Soviet nuclear program. 147/

In coming to this conclusion,

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neatly avoided the difficulties inherent in trying to imagine how missiles could be assembled, checked out, fueled, and launched from such an installation, while at

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the same time accounting for the thick concrete walls and general impression of hardness conveyed by the nature of construction at the site. These speculations, particularly the ones envisaging use of the facility for launching missiles, caused considerable agitation in the small circle of persons witting of their content and import. At a time when overhead reconnaissance had yet to provide evidence indicating whether or not the USSR might have achieved a spectacular breakthrough in the development of missile systems, the result was to conjure up, in the minds of those concerned, a vision of clouds of Russian missiles raining down on Western Europe and/or the United States following any refusal by Western powers to submit to Russian blackmail.

Further action involving HTA followed swiftly on the heels of the consultant briefings. As of 18 January 1957, the OSI/GMD requirement carried a triple-A priority, and HTA was asked to provide support to [redacted] 25X1 of OSI/GMD and [redacted] 25X1 of AFOIN, as representatives of GMIC and JAEIC, respectively, in connection with a forthcoming joint assessment of the Mozhaysk installation. 148/ Even if the purpose of the facility was still an enigma, it was evident that the Intelligence Community

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thought it was either a missile-launching enigma, a nuclear enigma, or both.

Between 18 and 31 January, when the desired information was issued in hard copy form, 149/* the Industrial Branch, which was responsible for HTA substantive work, engaged in a crash effort that took precedence over every other project in the branch. For the month of January as a whole, nearly 41% of all Industrial Branch project time was charged against the Mozhaysk problem; one-half of all branch overtime was spent on just one phase of Mozhaysk, namely, the special study done in support of the joint JAEIC-GMIC assessment. 151/ Nor was this the total, in all probability, of even the major portion of the HTA commitment on this phase of the Mozhaysk study. The OCR collateral researchers, the photo lab, and reproduction personnel were all very heavily involved, and the Technical Intelligence Branch provided critical measurements. 152/ In January 1957, and for the next two months, Mozhaysk was the biggest thing in the world of HTA.

Not surprisingly, results of the joint JAEIC-GMIC

* Essentially the same interpretive material in revised form -- plus a stunning volume of photographs, line drawings, and perspective sketches, prepared for use by consultants, and comparable to the four HTA briefing-aid books -- was issued as HTA/R-1/57, the first Photographic Intelligence Report produced by HTA. 150/

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assessment were inconclusive. They did, however, represent some progress toward the ultimate solution. The assessment substantially discounted the possibility that this was to be a missile launching site, though it did not end such speculation. On the other hand, it suggested somewhat vaguely that the site was probably an atomic energy installation, 153/ an hypothesis that was more compatible with the observable facts, and one that was elastic enough to cover the ultimate solution. But the solution was still a few years away.*

The assessment did one more thing. It pointed out the lack of COMINT information or other source material that would clarify the intended function of the Mozhaysk installation. In all this Community-wide, high-level deliberation one fact was obvious, namely, that without TALENT photography and without the keen eyes of the photointerpreters in identifying the Mozhaysk site as something of potential intelligence interest, nothing about this ominous installation would have been known to US intelligence. The dependence on photography was further emphasized by the recommendation that additional

* For the solution, see p. 97, below.

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TALENT coverage of the installation be obtained on a priority basis. 154/

This recommendation touched on a subject already begging attention. Nearly a week earlier, on 24 January, a group of analysts had met to discuss possible need for new photographic coverage of the Mozhaysk installation. 155/ Their verdict was, predictably, in the affirmative. Location of the installation north of 56° N, however, prompted questions about sun angle, snow cover, and their effects on the interpretability and information content of aerial photography taken at such high latitudes during the winter season. HTA was assigned the task of trying to arrange for an early test flight over high latitude portions of North America, and of examining World War II German photography taken at the latitude of Mozhaysk in the winter to determine the significance of snow and shadow factors at various times of day. 156/ In spite of animated interest by analysts in obtaining new photographic coverage of the Mozhaysk site, the proposal was not adopted. For the time being, analysts would still have to struggle to determine the purpose of the installation without comparative coverage and on the basis of just two frames of photography taken on 5 July 1956.

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Even if new photo coverage was not forthcoming immediately, the Intelligence Community was as yet unwilling to settle for the inconclusive findings stemming from the information on hand. In a further effort to achieve a breakthrough, the Agency arranged a conference at Headquarters that would bring together at one place and at one time a cross-section of the country's best scientific talent representing disciplines that might be involved in matters analogous to those likely to be carried on in the Mozhaysk installation. Consistent with the key importance of photography, HTA would play an important role in the presentation of the photographic evidence.

On 25 February 1957, an invitation was issued over the signature of [redacted] the Assistant Director, Scientific Intelligence, to eight eminent scientists, representing government, private industry, and research facilities managed by institutions of higher learning. 157/ These men were invited to meet with key intelligence officers and photo interpreters to discuss "certain new intelligence information."

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On Thursday, 7 March 1957, the panel was convened at 0915 hours in the DCI conference room in the old Administration Building for a day-long session. 158/

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The conference was to consist of a morning and an afternoon session interrupted only by lunch in the Director's dining room. Both morning and afternoon sessions would be opened with presentations of the evidence. Appropriately, in view of the key role of photography, Lundahl made the initial presentation of evidence at the morning meeting. 159/

Leaders of the conference and conference members were especially interested in getting first-hand Werner von Braun's ideas about the installation. His earlier speculation that nuclear-powered intercontinental missiles might be launched from Mozhaysk was the most

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exciting and ominous of all the hypotheses. On the other hand, they were reluctant to reveal the true nature or source of the photography because of von Braun's former Nazi connection. He had previously been shown no TALENT photography as such, and it was decided in March 1957 to continue the deception. Accordingly, a calculatedly degraded photograph was prepared to back up the elaborate engineering-type drawings and perspective sketches prepared for the consultants, all of whom were TALENT-cleared. When Lundahl dutifully showed von Braun the photograph and explained it was taken with a 35-millimeter camera surreptitiously from an aircraft von Braun exclaimed, "You get all this information from one picture like this? You must have the world's greatest photo interpreters. I never saw anybody who could do such a thing as this. How you all do that?" 160/

Von Braun had waited outside the conference room until it was time to hear his interpretations and observations. When the consultants had finished with his testimony he left, and the conference continued without him. 161/ This shabby treatment of one of the great figures in missile technology struck a discordant note in an otherwise memorable meeting.

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[redacted] concluded the afternoon session by leading a recapitulation of ideas developed during the presentations and discussion. No formal conclusions were drawn up, but the summation indicated:

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1. That the installation might be for the launching of IRBMs, but not ICBMs, and that, in any case, it would not be used to launch nuclear-powered missiles.

2. That the installation was not intended as a nuclear power plant, but that it could conceivably be used for the testing of prototype nuclear reactors.

3. That more effort should be devoted to studying the installation from an applied engineering point of view, with particular reference to the scheduling of construction in the light of research developments two or three years prior to early 1957. 162/

Within the next several days, the consultants came to the Steuart Building to see HTA and to talk with photo interpreters about the Mozhaysk installation. Even this additional chance to think and talk about Mozhaysk provided no further insights or opinions on the purpose of the installation, however.

Though HTA photo interpreters stuck to the task of extracting as much information as possible from the photography and presenting it to intelligence analysts and consulting engineers so that they could form their judgments, the long hours the PIs spent poring over the

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two frames of photography could scarcely have left them without their own speculations. And it didn't. To a man, the HTA photo interpreters gave little credence to the supposition that the Mozhaysk installation was a missile launch site. Their strongly held opinion was that it was somehow nuclear related, but, like others more expert in such matters, they were unable to identify the function precisely.

Having failed once again to achieve a breakthrough in solving the Mozhaysk riddle, Community effort devoted to the achievement of this objective waned in the ensuing months. Though there were to be further limited efforts during the spring and early summer of 1957, it

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In spite of the unique role played so successfully by photography and photo interpreters in revealing and stimulating discussion about the Mozhaysk installation, the incident also demonstrated the fact that without

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collateral information or knowledge, photography alone may be insufficient to identify and determine the functioning of an unfamiliar installation. The Mozhaysk experience thus provided dramatic confirmation of the philosophy of operation espoused by Lundahl and others in the founding and development of the CIA Photo Intelligence Division. From the beginning, they had emphasized the need for all-source information as an adjunct to the successful exploitation of photography.

Any assessment of the significance to HTA of work on the Mozhaysk installation would certainly reveal that it was an important milestone. This importance transcended mere considerations of time expended, number of PIs involved, or acceptance of around-the-clock work as a periodic necessity, although these were all noteworthy. As the first major unidentified Russian installation, Mozhaysk introduced HTA to the glamour, apprehensions, and frustrations that were typically associated with the discovery and interpretation of such targets. The Mozhaysk problem provided further opportunities for HTA personnel to develop and elaborate their working contacts with intelligence analysts in CIA and elsewhere in the Intelligence Community. Indeed, it demanded them. More important still, it

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projected HTA and its personnel into a position of national prominence, albeit a carefully guarded one, among selected leaders in the American scientific community, particularly in the fields of guided missiles and nuclear energy. Work on Mozhaysk brought with it the AEC Q clearance for a few HTA photo interpreters, giving them access to "Restricted Data." The effect of these growing contacts and burgeoning knowledge would be reflected in rapidly increasing opportunities for training and on-site trips, with a consequent increase in the ability of the PIs to deal effectively with exotic targets in the military and scientific fields.

The fall-out from the Mozhaysk project was not without its detrimental effects, however. The advantages thus gained by PIs in the Industrial Branch further widened the gap between them and their fellow workers in the Geographic Branch. The latter, doomed to unexciting work on more conventional geographic and industrial targets and without an opportunity to share in all the glamour and advantages deriving from work on the highest-priority targets in the Intelligence Community, began to feel that they were being neglected. Industrial Branch PIs, not those in the Geographic Branch, met and worked with high-ranking Agency and military

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personnel, and with renowned scientists. When on-site trips were planned to US missile and nuclear installations and related manufacturing facilities, it was PIs from the Industrial Branch, not Geographic Branch, who did the traveling. When Q-clearances were first obtained for HTA photo interpreters, it was PIs from the Industrial Branch who were first cleared, not those in the Geographic Branch. Though the morale problem did not become a serious one at this early date, circumstances were inexorably defining and widening the differences between the two types of assignment. Unless something unexpected intervened, the day would come when something would have to be done about the situation.

F. Testing. . . Testing

With the arrival of 1957, D/GP support of the OSTIARY* program entered a new phase. Preparations for testing the system at Eglin Air Force Base were proceeding right on schedule. Photo Intelligence Division personnel, particularly [redacted] had already spent a substantial amount of time in support of development and contract work. Now they would be called upon

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* For further information on the OSTIARY program, see pp. 41 and 63, above, and p. 175, below.

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to spend even more time during tests, a prospect made all the more likely by the marginal nature of the lighting system. Obviously, such a situation called for the exercise of some prudence, and D/GP gave evidence of having diagnosed the potentially extraordinary demands that might be levied on limited division resources.

Indeed, as early as the previous fall reports of trips to contractors' plants were being directed all the way up to Otto Guthe, Assistant Director, ORR. 164/ Now, in January 1957, Guthe was being tied into the commitment for testing the equipment. In a memo prepared for Guthe's signature by [redacted] the chief, Psychological and Paramilitary Staff, DDP, was promised that [redacted] [redacted] and Pearse would be available for duty during the testing phase at both Eglin AFB and Headquarters, and that they would prepare interim as well as comprehensive reports of photographic testing for the Air Maritime Division, DDP. 165/ All was now in readiness for D/GP participation (Figure 16).

On 29 January 1957, [redacted] departed [redacted] Washington bound for Pensacola, Florida, and Eglin AFB to begin tests on the photographic system. Four times between that date and the end of March, [redacted]

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made the trip, spending all or parts of 37 days in transit or at Eglin field. 166/ On two occasions they were also accompanied by [redacted] who provided technical support with reference to the projected use of radar sensors in the P2V aircraft. Though several more trips were made later in the spring and in the summer of 1957, the peak of D/GP participation was reached in March.

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Field testing at Eglin field involved three items: 1) calibration of the CAX camera; 2) checking of the altitude of the aircraft, and 3) monitoring the lighting efficiency of the Garrett pods, each of which contained 16 ultraviolet lights.

The test range featured a number of survey points, each of which was marked with a stake. A battery with a flashlight bulb on top was taped to each stake prior to test runs. Since the precise location of each of these survey points was known, this network of points could be used to calibrate the camera. It was also possible to use these points to calculate the height of the aircraft from photographs taken as it passed over them.

To check the effectiveness of the lighting pods, as well as to provide another check on the altitude of the aircraft, [redacted] took photographs lying

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flat on their backs on the ground as the airplane passed directly above them. These photographs would reveal how many of the lights were functioning. Because the distance between the pods was known, they could also be used to calculate the altitude of the aircraft. 167/

Prolonged testing was ensured by a whole host of problems that developed almost immediately. Some were so serious as to cast doubt that they could ever be solved successfully. Most fundamental was the persistent failure of the lighting pods to meet specifications. Designed so that they were powered by propeller-driven air turbines, the speed of the aircraft while operating on its two reciprocating engines was insufficient for the air turbines to generate enough power to light all the bulbs. When the small jet motors under the wings were cut in, the increase in air speed was adequate to light all the bulbs, but the increase in fuel consumption then reduced the range of the aircraft by a factor of about seven. 168/

Malfunctioning of the lighting pods created or exacerbated other problems. Insufficient light called for compensating measures, such as use of a faster film, increase of exposure time, lower flying altitudes, and increased speed to keep the lights on. Faster film

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increased processing problems and degraded the image. Longer exposures, lower altitudes, and increased speed aggravated image motion compensation problems. Lower flying altitudes were difficult to achieve and, in any case, hazardous. The dangers inherent in flight down to an altitude of 150 feet at night over unfamiliar terrain virtually precluded operational use of the photographic system.

D/GP personnel also frequently flew with crews on test flights to check operation of the cameras. The arduous regime of flight testing at night, developing film and performing rudimentary measurements in the wee hours of the morning, and then briefings at 0700 hours for those in charge of the program were sometimes relieved by unexpected diversions. On one such occasion, with [redacted] aboard, the sensing system failed to operate. On the spur of the moment, the crew decided to fly to Andrews Air Force Base for a short visit home. The unanticipated arrival of an Agency-owned, Navy plane with Air Force markings was calculated at best to create some difficulties in communications. The fact that a rain and hail storm through which they had passed washed off the identifying Air Force decals virtually precluded satisfactory communications. When the tower

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operator at Andrews AFB saw the big, black, unmarked P2V on the ground, he ordered it parked out of sight of the operations building. He wanted no questions asked about that bird. 169/

In spite of months of effort, attempts to bring flight testing of the photographic systems to a successful conclusion ended in failure. The basic problem of providing sufficient light remained unsolved, and the night photographic system was never used operationally. The "Warthog," as this reconnaissance version of the P2V was appropriately known because of the many protuberances on its surface, did, however, fly operationally in the Far East at a later date using other sensing systems. 170/

G. Signs of Drought

As March 1957 drew to a close, activity at HTA was showing signs of easing. In an organization that had scarcely known a tranquil moment since its inception, these signs were something new. Heretofore, in spite of the arrival on board of many new and willing hands, the backlog of requirements seemed to increase, and the number of tasks seemed to grow. Now, for the first time, there was reason to wonder what the future might hold.

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It was not as though there was widespread unemployment. Rather, the change in mood was based on a number of different indicators. Chief among them was the fact that there were as yet no more deep U-2 penetrations of Russian airspace. Most of the jobs under way -- and there were many, chief among them the current excitement about Mozhaysk -- were based on photography obtained the previous July. Many in HTA were aware, moreover, of the pilot-type operation that was HTAUTOMAT. If there were no more penetration flights because of Russian protests, what would the future hold? And then there was the unresolved question as to whether CIA would continue to control the TALENT program, or whether it would be turned over to the Air Force.

In a closely knit organization like HTA, where togetherness was emphasized by stringent security controls and compartmentation, there were no signs of unrest or undue concern. No one, from the lowest-paid clerk to the most knowledgeable PI, was without some appreciation of the importance of HTA accomplishments and contributions to national intelligence. All seemed to have an abiding faith that there would be no curtailment in the strategic photographic reconnaissance capability that had been developed so brilliantly.

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Their faith was, indeed, well placed. Though not generally known in HTA, work was already under way by March 1957 to bring into sharper focus the highest-priority strategic targets against which collection efforts should be directed at such time as the stand-down in U-2 flights ended. On 27 March 1957, James Q. Reber, as chairman, Ad Hoc Requirements Committee, prepared a memo for Bissell giving guidance concerning the "highest" and the "high" priority targets in western USSR, the Soviet Far East, and the European Satellites. 171/ The main object of this memo was to identify 35 highest-priority targets, on which information was needed to fill gaps about the Soviet guided missile capability against the United States, the Soviet long-range bomber capability, and the Soviet nuclear production capability. The seven categories of targets against which the U-2 collection effort had been directed in July 1956 was now narrowed to three of paramount interest. Clearly the concern now was to learn about the Russian nuclear capability and the Soviet ability to deliver nuclear weapons against targets in the United States. It was hardly likely that the United States or the US Intelligence Community would permit the impairment of the only good means for collecting and exploiting materials

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yielding this vitally important information.

On the other hand, if there were a temporary drought in work, HTA would be provided a welcomed opportunity to take count of stock and to prepare for vitally important tasks that were almost certain to come. Above all there would be an opportunity to modify the organization and reassign personnel on the basis of lessons learned over the previous nine months. There would also be a chance to provide additional training for HTA photo interpreters and to familiarize them with scientific and technical targets for which they would be searching in the USSR by exposing them to on-site inspection of analogues in this country. These were among concerns that would dominate the thinking and the work in HTA during the next several months.

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IV. Reorganization and Renewal

Experience during the first nine months under HTA proved different in many respects from initial expectations. Management of the operation, ever alert and adaptable, undertook to assess the situation and prescribe the indicated changes. As early as 1 February 1957, Lundahl had noted that the mission under which HTA was operating was obsolete and he called for a revision of mission, functions, and operating procedures with a view to HTA becoming a ". . . separate office or PI center in CIA." 172/

In addition to organizational changes, it soon became apparent that there should be improvement in the efficiency and effectiveness with which D/GP personnel performed their tasks. Expanded PI training would be sought for the younger recruits to ensure a thorough understanding of fundamentals, including those having a bearing on mensuration techniques. Broader contacts would be cultivated with other intelligence analysts and organizations in the Community through conferences, attendance at briefings, and joint work on problems and

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targets. On-site trips would be arranged to acquaint PIs, senior as well as junior grade, with exotic US military and industrial installations. Finally, efforts would be redoubled to develop key equipment needed to maximize the exploitation of photography for scientific and technical purposes.

In spite of all these plans and programs, photo interpreters and production personnel persevered with the exploitation tasks on hand in an attempt to bring them to completion as soon as possible. HTA managers who knew of Reber's memo on revised targets for collection were only too well aware of the impact the receipt of the first photographic coverage of Soviet missile launching and nuclear production facilities would have. They wanted to clear away as much of the backlog as possible before any such inputs were received.

A. Training and Orientation

Most significant of the several facets of the professional development program was the inauguration of on-site trips to US missile and nuclear installations. Though conceived as necessary the previous summer, 173/ little progress had been realized toward getting the trips under way, chiefly because it was difficult to

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justify interruption of project work in favor of training, however desirable the ultimate objective.

Arrangements for the on-site trips required support from intelligence analysts and supervisors in components for whom the PIs were providing information. Work done over the first three months of 1957 by HTA on Mozhaysk did much to dramatize the need and enlist additional support from supervisors and managers in other intelligence components for these trips, particularly in OSI and in the military services. The main impetus came from the Industrial Branch where supervisors and photo interpreters were struggling to identify and explain the functioning of installations with which they were quite unfamiliar. Thus it was that personnel chosen for the first several trips, including all those in the spring of 1957, came from the Industrial Branch.

On the first such trip, as in the case of many subsequent ones, several HTA photo interpreters joined their counterparts in OSI. On 3 April 1957, [redacted] 25X1

[redacted] left Washington for a trip to south- 25X1
eastern United States missile and nuclear installations.

[redacted] of OSI/GMD and [redacted] of OSI/NED 25X1
accompanied them throughout the trip; [redacted] DAD/OSI,
joined the others briefly for the tour of Cape Canaveral.

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The first stop was at Cape Canaveral where, among other things, they saw the first Atlas missile in place for a scheduled firing later that month. In addition, the second Atlas brought to the Cape was still on its cross-country trailer in the hangar. Members of the group also examined several completed Atlas launching sites as well as Titan sites in early stages of construction. They observed servicing towers, handling vehicles, LOX and nitric acid storage facilities, control blockhouses, underground cable and water lines, and water pumping stations. To PIs who would be expected to identify and interpret such items on photography of Russian missile testing centers at such time as the anticipated coverage should be obtained, this opportunity to examine these observable features of the landscape and to have their functioning explained was a revelation. For the first time, they would be aware of what to look for.

Following a two-day stay at Cape Canaveral, they moved on to the Army Ballistic Missile Agency at Huntsville, Alabama. Here, the visitors were introduced to the entire Redstone and Jupiter programs, from blueprints to the static testing of engines. The next day they saw some of the smaller tactical weapons at nearby Redstone Arsenal.

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a construction engineer, [redacted], a boyhood friend 25X1

[redacted], who pointed out to him how advantageous it 25X1
would be to identify and study the relationships of key
facilities from the air, and arranged a helicopter
flight. This was the highlight of the trip from a PI
point of view. Here at last, was an opportunity to view
those things that the PI would be called upon to identify
and explain on photography, and to see them from over-
head as the camera would record them.

At all installations, of course, there were il-
lustrated briefings as well as tours. HTA members in
the party saw many slides, models, pictures, and movie
films. As time permitted, they selected slides and
pictures, copies of which were deemed desirable for
use at the Steuart Building. They also noted sources
where movie films could be obtained, with the intention
of borrowing them for showing at HTAUTOMAT. From the
models and from the briefing rooms and displays, they
brought back ideas which were subsequently used by HTA
in its presentations. In closing his trip report, [redacted] 25X1

[redacted] pronounced the value of all they had seen and learned 25X1
"inestimable."

[redacted] made three recommendations based on the 25X1
experiences of this first trip:

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1. All Industrial Branch personnel should have a "Q" clearance.
2. The photo files at each of these and similar installations should be exploited by HTA personnel for the purpose of procuring copies of those pertinent to the HTAUTOMAT operation.
3. Regardless of work load and staffing, more such on-site trips should be scheduled, and Industrial Branch PIs should attend available courses of instruction in atomic energy, guided missiles, electronics, and related fields. 174/ With the benefit of historical perspective, this on-site inspection trip proved to be notable for reasons far more important than the fact that it was the first. This trip not only demonstrated the way to fill a conspicuous void in the capability of HTA photo interpreters, but also expanded the horizons of their supervisors by introducing them to a whole new world, of whose existence and dimensions they were only vaguely aware. Moreover, the close association of PIs and intelligence analysts on the trip served to demonstrate, with examples, the types of things in which PIs were interested and needed to get their jobs done. This, in turn, enhanced the initiatives that intelligence analysts and their

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supervisors might take in making suggestions for PI participation in additional trips and courses. Indeed, this trip, together with the consultant contacts begun a month earlier during the Mozhaysk exercise, marked the first steps in the development of a broad-gauge PI capability in HTAUTOMAT and successor organizations that were to set HTA photo interpreters apart from others in the Intelligence Community. Before many years, it would be established clearly that HTA PIs excelled all others in dealing with critical targets of national intelligence interest.

The second, and only other, on-site trip during the spring and early summer of 1957 took place between 10 and 21 June when [redacted] of the Industrial Branch, accompanied by [redacted]

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[redacted] of ORR/S/GM visited several US guided missile research and production facilities. Among the sites visited were the Air Technical Intelligence Center and Wright Air Development Center at Wright-Patterson AFB, Dayton, Ohio; the Soviet Missile Technical Intelligence Group at Kelly AFB, San Antonio, Texas; White Sands Proving Ground, Sandia, New Mexico; North American Aviation facilities at Downey, California; Hughes

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Aircraft Corporation at Culver City, California; Douglas Aircraft Company at Santa Monica, California; and Convair Aircraft Corporation facilities at Pomona and San Diego, California.

Like the earlier trip, this one involved the usual briefings and ground tours at each site visited.

[redacted] also had an opportunity to fly over, but not hover above, the missile range at White Sands at low altitude in a light conventional aircraft. Unlike the earlier trip, this one was confined to just one type of target, namely, to guided missiles and associated electronics. Moreover, considering the number of sites visited and the distances involved, the pace was faster and afforded little opportunity to do more than look, listen, and then hasten to the next stop. Even so, it provided a valuable introduction to a wide range of installations and information not previously familiar to HTA personnel. It was also the first trip to some of the very important installations in the West.

In his trip report, [redacted] made just two recommendations. He echoed and refined [redacted] plea for more such trips by suggesting that all PIs should visit facilities falling within their own spheres of specialization. He also urged that, in planning future trips,

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time be allowed for searching photo files at installations visited so as to facilitate selecting items that should be copied and forwarded to HTA. On his trip,

[redacted] had been frustrated by a lack of time to peruse such files. As was the case with [redacted] felt that these photo files held much information of vital importance to photo interpreters who would be called upon to interpret similar Russian installations. 175/

Apart from the on-site trips, HTA stepped up training in photo interpretation techniques. During the spring of 1957, eight PIs completed the 10-week portion of the course at Navy PIC. 176/ In July 1957, five more enrolled in the next offering of the same course. 177/ In this PI training, there was no distinction between PIs in any of the branches; IB, GB, SPB, and Central Branch were all represented.

Central Branch, with its traditionally oriented PI tasks, chose still another way to augment the composite skills of its personnel. In May 1957, [redacted]

[redacted] completed the Agency report-writing workshop. 178/
A month later, [redacted], chief of the branch, and one of his photo interpreters, [redacted] completed the course in report writing. 179/ This concern for writing reports revealed an uncommon appreciation by

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[redacted] of the need for effective communications to complete the reporting cycle. In a technical field, such as photo interpretation, where the primary capability and interest of the person was in the extraction of information from the photography, the careful preparation of the written report frequently required more than routine attention on the part of the supervisor plus an above-average capability and interest on the part of the PI. Moreover, under circumstances where PIs were laboring on a sizable backlog of high-priority items, information on which was initially disseminated by word of mouth, this chronic deficiency was aggravated by the pressure of work. In Central Branch, where there was more time to reflect and then act, something was being done to correct the deficiency.

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Nor were those in PI positions the only ones whose capability and career development became the objects of interest to HTA managers and supervisors. From 15 through 26 July 1957, [redacted] of the Technical Intelligence Branch and [redacted] of the Special Projects Branch were sent to a two-week summer course in photogrammetry at the Massachusetts Institute of Technology. 180/

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Internal training of a non-technical nature was also provided HTA personnel, at least selectively. Though key managers and supervisors were, generally speaking, still too busy to be spared from their duties, the pervasive conviction that D/GP and HTA were headed for bigger things argued for developing further the managerial and supervisory talents possessed by those immediately under them. Thus, prior to his going on the first major on-site trip in April 1957, [redacted] completed the Agency course in Basic Management. 181/ In May, [redacted] the acting deputy to [redacted] in the Support Staff, finished the Agency course in Basic Supervision. 182/

Finally, though several newcomers had been sent to the CIA Intelligence Orientation Course over previous months, attempts were now made to respond more freely to the Agency requirement that new employees get their basic orientation as soon as possible. Thus, during the spring of 1957 many of the older hands, who had previously been withheld from such training on the plea of crash work such as the preparation for and receipt of early U-2 inputs, were now scheduled for this course. Thus, some of the PIs who had been on board from several months to a year or more joined newcomers in the IOC. 183/

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B. Training and Orientation Offered by HTA

In turn, training was offered by HTA for others in the Agency. The spring of 1957 also marked a resumption of the D/GP photo interpretation course, which had been suspended the previous fall after one offering. On 5 June 1957, the course was offered in Room 206 Central Building, under the immediate direction of [redacted] 184/ Though some lectures were presented by Central Branch personnel, many others, such as the one on mensuration by [redacted] of the Technical Intelligence Branch, were given by specialists from other D/GP branches.

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This offering of the course, in which the number of sessions was increased from 11 to 18 by the incorporation of material on landforms, vegetation, land use, urban development, military installations and weapons, and electronics facilities, 185/ was regarded as the first in a new series of courses and was alluded to as Basic Photographic Interpretation Course No. 1. 186/ The course featured another and more exciting departure from previous custom, namely, the addition of an over-flight in an Agency aircraft of industrial facilities along the Middle Atlantic seabord. 187/ Because of the expansion of the scope of the course, it was agreed

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that it would soon be followed by a special course designed to provide those who had taken earlier PI courses with an opportunity to cover the newly added material. 188/

During the spring and early summer of 1957, HTA continued to provide exhibits and briefing personnel, as in the recent past, for the Intelligence Products Exhibit. 189/ Lecturers were also provided for the Intelligence Orientation Course. 190/ In both cases, however, the exhibits, discussions, and lectures had to be restricted to the SECRET level, precluding any inkling of exciting developments in connection with the exploitation of U-2 photography. Partly because of this restriction as well as the fact that Central Branch was the focal point for training in the division, support for the Intelligence Products Exhibit and IOC was provided by personnel in that branch.

C. New Tools for Eager Hands

In spite of the lead time needed to define requirements and obtain equipment, and the even longer lead time needed to develop specialized devices, by the spring of 1957 HTA was beginning to make progress away from the traditional pocket stereoscope, tube magnifier,

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PI slide rule, and desk calculator toward a more sophisticated and higher capacity type of operation. And it was none too soon. Even with the exploitation tasks provided by a meager eight missions -- those over the Middle East were primarily tactical and provided little challenge -- PIs and Photogrammetrists were taxed severely at time to get the job done.

One of the most critical areas was technical exploitation of the photography. Once analysts saw the high quality of the photography, they began to ask questions of a type and in a volume that had not been anticipated. Indeed, many requirements dealt with matters beyond the ken of interpreters whose previous experience was bounded by tactical military reporting, work in the earth sciences, and mapping.

To provide better quantitative information, during the first year of operation HTA acquired two comparators. One was a Mann borrowed from Navy PIC, the other a machine developed by Photogrammetry, Inc., of Silver Spring, Maryland (Figure 17). Both instruments, which were probably accurate to two microns, were dial read. To reduce possibility of error in recording information, each value was read twice by the operator before being recorded by a second person (Figure 18). Data, consisting

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of x and y coordinate measurements, were reduced with aid of a desk calculator. 191/ This was the general extent of automation and sophistication of the measurement capability at HTA at the close of the first year of operation. If it seems unimpressive, at least the trials and frustrations to which it was exposing TIB personnel were surely pointing to the obvious solutions that lay beyond the terra incognita yet to be transversed.

May 1957 witnessed the arrival of the so-called Reed rectifier and Reed transforming printer (Figures 19 and 20). 192/ These pieces of equipment, which had been modified for use at HTA from similar rectifying printers developed under auspices of the Wright Air Development Center for use at ACIC, 193/ were made necessary by the advent of the B camera,* which was capable of photographing from horizon to horizon. When the rectifier was installed, it was the only one in the United States capable of handling photography with tilts up to 75 degrees, but it could not accomplish as much as this in one step. Common practice was to perform the first step on the transforming printer, a

* For further information on the B camera, see p. 65, above, and 263, below.

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fairly rapid operation, and the second and final step on the rectifier, a much slower and more tedious operation. The greatest use for these two pieces of rectifying equipment at HTA was in the production of matched prints for use in laying photo mosaics.

With the end of the fiscal year approaching, HTA was confronted with the perennial problem of what to do with unexpended funds. One day [redacted] who functioned mainly as spokesman for the office of the chief in matters involving R&D and equipment procurement,

burst into [redacted] office with the words, "Hey, John, 25X1
what computer do you want? We'll get it for you." 194/
There was a residue of \$50,000 in the budget which had not yet been committed to other uses. The painstaking investigation that [redacted] had conducted the previous fall 25X1
of available small computers and their adaptability for use in HTA was about to pay off.

In his investigation [redacted] had considered the 25X1
computer as part of a complete system for achieving the maximum exploitation of U-2 photography to serve Community needs. In May 1957, there were over 110,000 frames of photography in the HTA library, two-thirds of which were oblique photography requiring rectification for precise exploitation. The system conceived

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would consist of comparators with flexowriter readout, the Reed rectifier and transforming printer, and the small digital computer. Requirements for rectification to provide services not only for CIA but also for the military [redacted] were estimated to total 3,020 cases per year. The system was designed to handle up to 3,480 rectifications per year.

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HTAUTOMAT estimated that without the proposed computer it would take nearly 14 man-years of desk computation each year to provide the minimum estimated services mentioned above. On the other hand, the computer was expected to require only 1/6 to 1/3 years of computer time to handle the capacity output of 3,480 rectifications per year. This would leave 2/3 to 5/6 years of computer time each year for handling other exploitation problems.

In addition to the expected on-going computer load for rectification work, an estimated 11-year backlog had already accumulated. This could be materially reduced by preparing scale number tables for use by the PIs in situations where non-critical measurements were needed. Whereas the time required to produce each such table for a given camera orientation was estimated at 16 to 20 man-hours using a desk calculator, it was

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estimated that the computer could do the same job in 15 minutes or less. Such tasks as these would utilize some of the computer capability not needed to fulfill minimum rectification requirements.

Beyond these straightforward, basic jobs, there were others that promised rich rewards but were so complex as to preclude even considering with a desk calculator, such as analytical bridging or cantilever extension to determine camera orientation for areas where no control information was available and the accomplishment of computer-assisted analytical stereo-photogrammetric measurements with least squares adjustment in cases where maximum obtainable accuracy was imperative. 195/

The decision to buy rather than lease the computer and the choice of brand and model were quickly made by HTA and concurred in by [redacted] of the Management Staff. 196/ The choice was an ALWAC (for Axel L. Wenner Gren, the Swedish industrialist), Model III-E, costing just under \$50,000. 197/ Of the small digital computers then becoming available, the ALWAC was the only one having a combination of word length, memory capacity, and flexibility of command structure judged necessary to perform the tasks envisaged at HTA. 198/ This judgment and the degree of confidence with which it was

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made were materially enhanced by a visit to Arlington Hall where [redacted] saw the NSA ALWAC-III in operation. 199/ After this visit, during which the capabilities and functioning of the machine were discussed with NSA personnel, the formal justification for purchase was prepared and the computer was ordered. It was some months, however, before it was delivered.

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Though Minicard equipment which had been expected in the fall of 1956 was still lacking in the spring of 1957, hopes were rising again that the date of arrival was not many months away. Accordingly, plans were already being made to provide orientation and training for those who would supervise the operation as well as those who would use the equipment. By May 1957, it was optimistically predicted that this orientation and training would begin almost immediately. Plans called for

[redacted] the deputy chief of the Statistical Branch, along with [redacted]

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of the Technical Section of that branch, to go to the Eastman Kodak Plant at Rochester, N. Y. Later, [redacted]

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[redacted] was to join them. [redacted] was to stay long

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enough to participate in setting up the training

exercises. [redacted] were to spend a month or

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more in learning to operate all components of the system.

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[redacted] whose duties and responsibilities were to be much more specialized, was to get a complete indoctrination on the operation and maintenance of the Minicard camera. 200/

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Even at this late date, in the spring of 1957, Statistical Branch managers had not yet abandoned hope of using Minicard to store, recall, and reproduce TALENT photography. The trials and tests at Eastman were to feature use of live U-2 photography from Mission 2024, one of the five that penetrated the USSR in July 1956. Photography from this mission was chosen because of the excellent range in quality that it afforded. 201/

Though the choice of personnel remained firm, the orientation and testing did not begin until the summer of 1957. Moreover, when it did take place it consisted of several trips of short duration that continued into the fall. It did, however, provide HTA personnel with the capability to operate the equipment at such time as it should arrive.

Not all the changes in techniques and equipment took place in the support elements of the organization. The summer of 1957 marked the start of a general retreat by photo interpreters from their traditional preference for photographic prints, as opposed to positive

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transparencies, for use in doing interpretive work.

For the first several months of the HTA operation, virtually all the interpretation, including scanning, was still done from prints. Though the loss of exploitable detail on prints -- generally believed to be on the order of 30% -- was not unknown to technical people and technically oriented PIs in HTA, prints were the first type of material provided for exploitation. For one thing, experienced photo interpreters were accustomed to using them, and they fitted into their habits of work. For example, PIs had an ingrained habit of marking notations on the prints with a grease pencil. The same pencil used inadvertently on the emulsion side of the film -- a not unusual occurrence at first -- was attended by results that caused PIs to shy away from use of transparencies.

In spite of PI reactions that ran the gamut from enthusiastic support in the case of a few imaginative souls, through indifference, to outright opposition, there were several influences at work that gradually tipped the scales in favor of transparencies. Whereas the quality of the photographic prints, compared with that of the original negative, was generally less than had been anticipated, the quality of the duplicate

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positives had generally met expectations. This was recognized by the keener and more adaptable PIs, who demonstrated in some of their work the greater potential of the transparencies. Other PIs, observing their success, began to realize the advantages. Much impetus was added to the use of transparencies when the Special Projects Branch, beginning in January 1957, used duplicate positives with great success in their major effort to resolve previously conflicting and incomplete reports on the number and type of aircraft reported from U-2 coverage of Soviet airfields. 202/ Later, when SPB photo interpreters were assigned to other branches and faced difficult and critical interpretation problems, they turned to transparencies. This was particularly true in the Industrial Branch where targets and projects covered many high-priority installations about which critically important questions were asked.

As PIs began to acquiesce, the chief deterrent to wider use of duplicate positives was lack of equipment adequate to realize the full potential of transparencies in detailed exploitation work. The sought-for breakthrough came as a result of the interest, initiative, and technical competence of [redacted] a photo interpreter who jury-rigged a microstereoscope by

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gluing a pair of prisms to a cardboard mount which, in turn, was taped to a binocular microscope (Figure 21). This instrument was so successful that it was avidly sought by other PIs making critical, detailed interpretations (Figure 22). In response to the growing demand as well as to provide a buffer against his own needs, [redacted] modified at least two other binocular microscopes for stereo viewing.

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The Machine Division of OCR was requested, as early as 6 March 1957, to construct a microstereoscope to [redacted] specifications, 203/ but no such instrument was yet available early in the summer of 1957. Later the [redacted] design would form the basis of an instrument produced by a commercial firm (Figure 21).

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D. Familiar Tasks

In spite of the ferment caused by travel, training, the acquisition or anticipated arrival of new equipment, and new exploitation techniques, the bread-and-butter work of interpretation, coordination, and consultation proceeded during the spring and early summer of 1957. The pace, however, was noticeably slower than at any time since the inception of HTA.

Reflecting the lack of new photographic coverage of strategic targets, the number of requirements and

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proportion of PI time spent on projects declined sharply compared with figures for the previous fall and winter. The nadir point in receipt of new requirements was reached in June 1957 when only eight new ones were logged into the Support Staff, compared with an average of 26 a month for the previous eight months. Five of the eight new requirements originated in D/GP itself. 204/ As work continued on old requirements and projects, the backlog began to shrink, particularly in the Geographic Branch, which had but five projects on the books by July. 205/

The decline in new requirements gave release to pent-up pressures for travel, training, and leave taking. The proportion of available time spent on projects in the Industrial Branch plunged from 89% in February to 37% in April, 206/ primarily as a result of a heavy schedule of on-site orientation trips and other more formal training. The comparable decline in the Geographic Branch, which saw the proportion of time spent on projects drop from 67% in April to 42% in June, 207/ was both later and less precipitous. In the latter case the primary cause was an unusual amount of leave taking, both annual and military, as well as a heavy program of training. By July, however, time spent on projects in the Industrial Branch had rebounded to

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79% of the total; 208/ for the Geographic Branch the comparable figure was 56%. 209/

Though long-deferred training and leave-taking did much to ameliorate adverse effects of the shrinking workload, the continuous arrival of new employees, selected months earlier, complicated the situation.

Concern over the vanishing backlog, greatest in the Geographic Branch, was reflected in attempts to generate new requirements. On 30 April 1957, [redacted] chief of the Geographic Branch, met with [redacted] chief of the Cartography Division, concerning the possibility of providing PI support for work in that division, but without positive results. 210/ In July, Geographic Branch representatives met with [redacted]

[redacted] of ORR concerning requirements for PI studies of certain USSR rail lines. Response from ORR was more encouraging and, with the low ebb of projects in the branch, work was begun on several rail-line studies in anticipation of forthcoming requirements. 211/ Even the Support Staff got into the act.

In June, [redacted] conferred with [redacted] of D/GG concerning possible future requirements from that division. 212/

At a time when all of the strategic coverage and a majority of the requirements dated back many months,

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project work and reports published during the spring and early summer of 1957 had a familiar ring to them. The unidentified installation near Mozhaysk was one such project. After lying dormant for several weeks as far as HTA was concerned, it came to life again in May when OSI sponsored a two-day meeting for nuclear-energy consultants on the problem. [redacted] of HTA attended the meeting. 213/ Mozhaysk was active again in June when [redacted] attended three more meetings, one held by the IAC and two in Barton Hall. 214/

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The 28 June meeting in Barton Hall was devoted to a recently issued Air Technical Intelligence Center (ATIC) report which supported the theory that the Mozhaysk installation was an operational IRBM launch site. In a memo dated 21 May 1957, [redacted] had cogently questioned some of the key interpretations given in this report and, in a reasoned summation, expressed serious doubt as to the validity of the theory. 215/ As time went by, HTA doubts were completely vindicated. HTAUTOMAT was displaying early signs of the astuteness and the expertise that were eventually to earn its PIs the reputation of being the most able in the Community.

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The critical examination of this ATIC report in HTA also revealed that analysts at ATIC had access to

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technical information concerning US missile systems that was not available to HTAUTOMAT photo interpreters. HTA requested that it be made available. 216/ On 19 June 1957, 22 such reports were forwarded on loan from ATIC to CIA for use by HTA and OSI analysts. 217/ Slowly but surely, HTA was taking its place as a full fledged partner in the analysis of high-priority targets of national intelligence interest.

Preoccupation with the Mozhaysk problem at this time was not to end with the stir over the questionable ATIC contribution to the solution. In July, nuclear energy analysts were back in the running with an OSI consultant meeting dealing with the nuclear aspects of the installation. This meeting was attended by [redacted] of HTA. 218/ The struggle to explain the function of this puzzling installation was continuing, but preoccupation with Mozhaysk was soon to be eclipsed by a flood of new photography on highly important identifiable installations.

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The spring of 1957 was also marked by interest in two Crimean installations covered by 10 July 1956 photography and thought to be related to the Russian missile program. April 1957 saw publication of a report on "Twin Eyes," an installation that had been the subject

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of a PI Alert the previous September. 219/ This heavily secured installation was situated on the Black Sea coast, five miles south of Sevastopol. It comprised what were called two probable missile launching pads, a probable control facility, three probable storage or assembly areas, and a probable electronics site (Figure 23). With benefit of hindsight, this proved to have been in the right ballpark; it was a cruise missile test site.

The second, which was under construction in July 1956, was located farther east, on the Black Sea coast of the Kerch Peninsula near the former village of Karan-git. It featured what was called a main operational area with a huge concrete pad and several associated buildings situated near the foot of a hill, a nearby facility occupying a commanding position on the hill, a support area, and several possibly related sites along the nearby coast (Figure 24). Characterized as an unidentified installation in a report issued late in the summer, 220/ the clear implication of the description and interpretation was that the site was missile related. This carefully hedged interpretation also proved to be in the right ballpark.

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Another familiar activity, meetings of the PARAMOUNT Committee, had been resumed in March and continued at weekly intervals during the spring. This revival coincided with the declaration of the "Eisenhower Doctrine," in a Joint Congressional Resolution approving and supporting the integrity of Middle East nations against Communist aggression. 221/ After a low-key effort compared with the tumult of the previous fall, the PARAMOUNT Committee was permanently disbanded following the meeting of 20 June 1957. 222/ Thus ended an early and highly successful experiment in the production of all-source intelligence involving close and continuous collaboration between photo interpreters and other analysts.

In addition to work on PI projects as such, HTA engaged in a busy round of activity in support of Project AQUATONE during the spring and early summer of 1957. At the request of Richard M. Bissell, James Q. Reber sought from HTA an evaluation of the comparative quality of film processed in the field and at Eastman Kodak. The conclusion reached by HTA was that the image quality of the film processed overseas was, unexpectedly, better than that done in Rochester, whereas the chemical quality of the latter was superior. 223/ Included with the HTA findings were recommendations

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for correcting the chemical deficiency in field processing. The greatest significance of the findings, perhaps, was the fact that a capability had been developed to process film in the field without degradation that might affect its subsequent usefulness. Additional washing could be accomplished, if necessary, once it arrived in the United States.

The results of the film-processing study provoked a reassessment of the million-dollar-a-year contract with Eastman Kodak for the processing of film. If field processing units turned out a product with a higher quality image, was there a need for the much-vaunted expertise of Eastman? In a memo dated 28 June 1957, Bissell directed Reber to proceed promptly with an assessment of the situation and to respond with recommendations concerning three alternatives; (1) continue the contract with Eastman, (2) assign certain processing functions to HTAUTOMAT or the Air Force, or (3) a general request for any other alternatives. In undertaking this assessment, Bissell requested that Lundahl as well as certain operations people be included in the study group and authorized them to visit the Eastman plant in the course of their investigations. HTA was, thus, intimately involved in fact-finding and recommendations concerning the film processing. 224/

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On 24 July 1957, a select group, under the leadership of Reber and including [redacted]

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[redacted] from HTA, but not Lundahl, visited the Eastman Kodak facility in Rochester. It is apparent from the Memo for the Record prepared by Reber that Eastman representatives managed to grasp the initiative and deflect much of the discussion to their own proposals and problems. At the same time, the record shows that Eastman was the benefactor of many appreciative remarks from HTA representatives. Indeed, in his concluding comments Reber noted the apparent hurt feelings of Eastman representatives over the displeasure of "Washington" with their work, and that, as a result of the constructive approach taken by the select group in assuring them that they could expect a sympathetic response to their proposals and complaints, their feelings were "assuaged." Reber made just one recommendation, namely, that there be, in the very near future, a discussion of the contents of the Memo for the Record, and that the discussants include Bissell. 225/

Insofar as HTA participation in the conference at Eastman was concerned, their testimony was clearly in favor of maintaining the status quo. As an exploitation organization, HTA would have little or no interest in

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assuming any substantial burden of film processing or reproduction. Nor could HTA be expected to view with anything but apprehension the possible involvement of the Air Force in the stateside processing and distribution of the film. D/GP managers and interpreters still had many scars from the struggle to gain access to SENSINT materials. Moreover, the prospect of having the Air Force get its hands on the film first was enough to frighten any prescient Agency PI. Clearly, the arrangement that established Eastman as a competent, neutral middleman with primary allegiance to CIA was one that couldn't be beat.

In still another way, HTA provided significant support to Project AQUATONE early in the summer of 1957. With planning under way for a series of highly significant penetration missions into the Urals and Soviet Central Asia, HTAUTOMAT was asked by [redacted] of AQUATONE for an opinion concerning the relative merits of using the A-2 and B* cameras for photographic missions in the immediate future. In spite of the larger scale of B-camera photography, HTA expressed a

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* For further information on A and B cameras, see p. 124, above, and p. 210, below.

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strong preference for the A-2 because of its alleged greater "reliability." 226/ Perhaps HTA was considering not merely reliability, as such, but also quality of the product. For many months after its introduction the B camera was plagued by severe vibration problems. The minutes of the Ad Hoc Requirements Committee meeting held on 16 August 1957 reveal that the unanimous opinion of those present was also in favor of the A-2 camera because of its reliability and the increasing quality of "its product." 227/ All USSR penetration missions flown for the next several months subsequent to the 16 August ARC meeting utilized the A-2 camera. Cooperation between collectors and exploiters was continuing productively, and HTA was leading the way.

Easing pressure in consequence of the shrinking backlog of projects provided opportunity for increased contacts between HTA and the analytical world at a time when emerging problems, like Mozhaysk, demonstrated the need for greatly improved PI familiarity with highly technical subjects as well as for closer collaboration between HTA photo interpreters and analysts in other components in the Intelligence Community. This situation only confirmed the wisdom of the philosophy that HTA and D/GP had embraced over the years. From the initial

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proposal by [redacted] throughout the Lundahl years, access to and use of all-source information, including COMINT, by the PIs had been a cornerstone on which the success of the organization was postulated.

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Moreover, as early as 1954 Lundahl had called attention to the need for Community-wide coordination and control in the planning of collection activities, the storage and retrieval of photography, the interpretation of photography, and the training of PIs. To achieve overall coordination and control, he had suggested establishment of a reconnaissance board with representation from all pertinent organizations in the Intelligence Community. 228/ When asked, however, about implementation of the suggestion to create the board, Lundahl deemed the time not propitious to press for its formation. 229/ Now, nearly three years later, Guthe, the Assistant Director for the Office of Research and Reports, with the advice and strong support from Lundahl, was reporting to Lyman Kirkpatrick and General Lucien Truscott, Jr., who were working on a revision of the NSCID's, that existing coordination in matters related to photo intelligence was inadequate to meet national requirements. He indicated that the precise nature of the necessary arrangements was as yet unknown, but said it would be

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the subject of a forthcoming staff study. From the context, it seemed clear that the recommended solution could well be the establishment of a subcommittee on photographic intelligence at the IAC level. 230/ Movement toward such a potentially controversial proposal was taking place very slowly, but the problem had not dissolved nor had it been forgotten. Though it was yet to be revealed whether CIA and HTA were ready to challenge the military services in a field where they had been pre-eminent, it was clear that HTA plus U-2 photography added up to considerably more muscle than a handful of PIs in D/GP three years earlier.

Despite the deficiencies noted in coordination of photo intelligence activities, Guthe conceded there had been some limited successes, particularly the work of the Committee for Coordination and Standardization of Intelligence Ground Photographic Procedures and Equipment, chartered under the Joint Chiefs of Staff but nominally chaired by Lundahl; and the Graphics Research Coordinating Group, which provided a forum for joint mutual assistance on problems of exploitation and requirements. 231/ Both had broad representation from Community PI organizations. Though the time had come when Lundahl was no longer able to attend or chair many of the meetings of the former, the

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committee was kept functioning smoothly and working productively by [redacted] who had long served as an executive secretary and now, alternating with [redacted] chaired the meetings in Lundahl's absence. HTA representation on the Graphics Research Coordinating Group, an informally organized committee chaired by the Air Force, consisted of [redacted] of the Support Staff, representing D/GP, and any of several representatives from the Statistical Branch, representing the OCR contingent. In the affairs of this committee, HTA played a more passive role.

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Simultaneously with the reawakening interest in coordination at the highest levels, HTA increased the tempo of coordination with organizations in the US Intelligence Community [redacted]

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[redacted] Thus, HTA personnel, including representatives from the office of the chief, the Industrial Branch, and the OCR Statistical Branch were regularly attending meetings of the Ad Hoc Requirements Committee, chaired by Reber, as observers.

Indeed, in April 1957, Reber wrote a memo to Guthe expressing great pleasure over his dealings with Lundahl and with HTA. In addition, he commented very favorably on the competence and dedication of HTA personnel. 232/

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Moreover, Reber pointed out that the remarkable cooperation and support he had received was achieved without a chain-of-command relationship. Here was one of the many precincts in which HTA and its chief were held in high esteem.

On 25 and 26 June 1957, in response to a request from the Assistant to the DDI for Planning, 11 hours of briefings were provided for [redacted]

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part of Reber, was given a tour of all HTA components, including the OCR Statistical Branch. He was briefed on Sovbloc TALENT materials and intelligence products derived from them, plus selected Middle East materials.

Two days later, also at HTA, [redacted] met Army representatives on the Ad Hoc Requirements Committee to discuss his own particular service interests. Among materials

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provided [redacted] in response to his expressed interests were an organization chart for HTA, with the names of key managers and supervisors, and a summary of R&D items, with pictures and brochures. Though not the only [redacted]

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visitor to HTA during the spring and early summer of

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1957, [redacted] visit was particularly noteworthy because of the wide scope, and great detail of the briefings as well as the precision of his inquiries. The

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searching nature of the latter was reflected in the careful rein kept on him. At all times he was accompanied [redacted] who recorded questions and requests and maintained custody of [redacted] notes. 233/

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With the widening of HTA horizons resulting from the multiplying external contacts with organizations and individuals, Lundahl's renown as a briefer and news of the exciting work being done in the Steuart Building spread fast throughout the Community. More and more, he was being called upon to brief high-level military and civilian personnel on the TALENT system and its products. In June alone, over 100 individuals from various agencies of the US Government were briefed and escorted through HTAUTOMAT. Some 64 of these, including 10 admirals, were from the Navy; nine others were from the Army and three from the Air Force. 234/ This was but one evidence of the growing rapport between the Agency PI element and the military services. As such, it represented a significant milestone on the road to a joint national PI center.

E. Reorganization and Reassignment

If there was one word that best characterized the nature of HTA and the organizations that preceded it and followed it, perhaps it was the word "change."

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Change in the case of HTA was both purposeful and constructive. At one time or another it meant growth, or exploitation of dramatically different photography, or the arrival of major new equipment, or changes in PI techniques, or any of a host of significant events or developments. Just now, early in the summer of 1957, it meant changes in the initial HTA organization and in the assignment of personnel to increase the effectiveness with which existing manpower could be utilized. It did not involve any increase in the 92 CIA slots that had been allocated to D/GP more than a year earlier. Also, it did not involve any change in the functional and administrative relationships between D/GP and the OCR Statistical Branch.

By July 1957, HTA had 74 professionals on board compared with 40 the year before. However, the manner in which these people were organized and assigned, was a result of decisions that had been made more than a year earlier, before receipt of the first operational inputs of TALENT photography, when the problem of how to realign and staff the organization to cope effectively with TALENT inputs and the resulting requirements was first considered.

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The first documented reference to plans for change was recorded in the minutes of an HTA staff meeting held on Friday, 1 February 1957. 235/ At this meeting, Lundahl stated that the mission and functions under which HTA was operating were already out of date and pointed up the need to revise the concept of operations to fit the situation as it currently existed. He sought the comments and suggested revisions of branch chiefs, who would be given copies of the current mission and functions for review.

Plans and suggestions for changes passed back and forth between the branches and [redacted] the executive officer, during the spring of 1957. By the end of June there was a reasonable consensus on the problems, and possible solutions were already under study. Needless to say, not all branch chiefs were in complete agreement with the context in which any given problem was considered, particularly when it boded ill for the future growth and development of the branch as envisaged by its incumbent chief. Similar exceptions applied to the emerging solutions.

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First and foremost were the problems of the Special Projects Branch; the functions to be retained by the branch, the number of persons needed to accomplish

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the new and more limited tasks, the position of the branch in the organization, and the question of who should manage it. The SPB view, which was closely identified with the strong personal convictions of

[redacted] was that scanners and plotters had to have project work that would maintain and increase their proficiency as PIs as well as keep them busy between missions and compensate for the boredom of their routine assignments. To accomplish all this, [redacted]

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estimated he would need 21 professionals. 236/ To keep the record straight, however, it should be pointed out that even the chief, SPB, was alluding to the needs of the new "Operations Support Branch," thus recognizing as an accomplished fact a change that was not as yet made public. Obviously, by this time, much of the SPB empire had already been lost, and prospects for what was left were at best uncertain.

The chief, Geographic Branch, who, with the chief, Industrial Branch, was most directly affected by the size and uninhibited approach to work that had become the hallmark of the Special Projects Branch, somewhat arbitrarily set the manpower requirement of the new Operations Support Branch at not more than 15 professionals. He added, moreover, that he seriously

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doubted that legitimate needs exceeded nine, and suggested dividing the six positions comprising the difference between the two totals between the Geographic and Industrial Branches. [redacted] chief, Geographic Branch, said his proposal had the concurrence of all branch and staff chiefs except the chief, SPB, whose concurrence he had, with some foresight, not sought. 237/

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A second problem, neither as urgent nor as well defined as the first, was the question of functions and authority vested in the Support Staff, whose responsibilities encompassed several potent and controversial functions, such as research on requirements, production control, and editing. All these impinged on the substantive interests and responsibilities of the PI branches and, unlike them, the Support Staff had no line authority. The situation in the staff was complicated somewhat by its leadership which consisted of a conciliatory member of the original PI group paired with an aggressive deputy who had a propensity for making command decisions. Though there was no discord between the two leaders or within the staff, differences in viewpoint made more difficult the setting of firm goals and a single-minded pursuit of them. In any event, in the summer of 1957, the Support Staff initiated no evasive action and, in effect, chose to stand pat on the existing arrangement.

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Opposition was led by the chief, Industrial Branch. Without attacking the Support Staff directly, he called for leaving "OCR functions to OCR," and for direct dealings between D/GP branches and OCR/SB. 238/ In the complex and uncharted areas of military and scientific interpretation requirements and projects, the procedures and controls instituted by the Support Staff were more confining than those established for the routine handling of requirements for industrial and geographic studies. In addition, the chief, IB, animatedly supported proposals to establish an enhanced graphics unit, a development that involved some curtailment of editorial responsibilities. At the same time, he expressed dissatisfaction with the responsiveness and speed of editorial services. 239/ Under the circumstances, it was obvious that the Support Staff was the object of concern that could cause trouble in the future, if not in the present.

A third problem, dramatized and presented by [redacted] [redacted] an ambitious PI with capability as an illustrator, and strongly endorsed by the chief, IB, 240/ was the production of graphics. Though SPB had no less than six graphics personnel, among whom was [redacted] an accomplished illustrator, the emphasis was on mission plotting and briefing board preparation rather than on

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support for detailed reporting. Discovery of installations like Mozhaysk and "Twin Eyes" emphasized the need for a first-class graphics shop geared to the preparation of drawings of all types in support of PI analysis and reporting, and, in particular, of high-priority work on military and scientific targets.

Plans for the establishment of the graphics shop created jurisdictional problems with the editors. Whereas the editors had previously, if briefly, controlled the publication following preparation of the manuscript, the prospective leaders of the new graphics shop were proposing to take over the planning, preparation, and production of PI reports, leaving to the editors the task of doing a copy edit of a manuscript in otherwise final form for reproduction.

Heretofore HTA reports had been strictly utilitarian, lacking visual appeal. The new proposals would impose controls and discipline in the determination of format; in the selection, sizing, and preparation of graphics, and in the presentation of text and graphics. Professional quality would be achieved by replacing Leroy lettering guides with Headliners, by use of a Vari typer for composing annotations and tables, and by the use of a Justowriter in typing the text. Multilith mats would

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be superseded by camera-ready copy typed on bond paper. Management and control by graphics personnel would reduce the role of editors to one of support in the refinement and correction of text and illustrative materials already essentially in final form. The editors demurred, thus initiating a long game of cat-and-mouse which continued as long as editors and graphics personnel were administered by separate components.

A fourth problem or change was proposals for revisions to the mission and functions of the Industrial Branch, and the adoption of a new branch name to reflect the evolution of branch responsibilities in the direction of military and scientific targets. In his comments on the reorganization dated 21 June 1957, [redacted] was already calling his organization the Military Scientific Branch and proposing a new set of functions. He said that these proposed changes had the concurrence of Beckett, chief of the Geographic Branch. 241/

A final problem was one raised discreetly in a memo from [redacted] as TALENT Security Officer, CIA, [redacted] who had been carried in the HTA organization as a member of the Administrative Staff, pointed out his far-ranging responsibilities as well as the fact that his office was, in effect, headquarters

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for the entire TALENT Control System, not just HTA.

He added that both [redacted] the administrative assistant, and Lundahl had agreed that the Security office should be separate from the Administrative Staff and that it should report directly to the chief, HTA, or to the executive officer. Not to overlook the value of the right name dropped, [redacted] closed with the observation that Lundahl had requested that this information be communicated to [redacted] 242/

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At the HTA staff meeting on 12 July 1957 [redacted] announced the organizational changes and new allocation of personnel. The Special Projects Branch, with its broad charter of operation, was dissolved and replaced by an Operations Support Branch having 15 slots. For the time being, at least, [redacted] would still be chief.

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The Geographic Branch, temporarily alluded to as the Sov Bloc Branch, and the newly named Military Scientific Branch would also have 15 slots each. The Central Branch, which had no official existence and would continue to be staffed informally out of the Geographic and Military Scientific Branches, was allocated eight slots. The former Technical Intelligence Branch, now called the Technical Intelligence Services Branch, would be increased in size to 17 positions with the acquisition of

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the graphics unit, which was to be transferred from SPB as soon as possible. The Support Staff would have slots for 10 persons. 243/ There would be no change in the organization or responsibilities of the Support Staff (Figure 25).

The first changes resulting from the announced decisions took place on 15 July 1957 when graphics personnel moved to their new quarters in the TISB work area on the sixth floor of the Steuart Building. 244/

[redacted] became chief of the new Graphics Section and 25X1

[redacted] his deputy. During the same month, 25X1

six persons transferred from SPB to the new Military Scientific Branch and five from SPB to the Geographic Branch. Though [redacted] announced at an HTA staff meeting on 26 July that all transfers were then completed, 245/ the last documented transfer took place on the last day of the month. 246/ 25X1

With the reorganization an accomplished fact, HTA was ready for the next big challenge, the arrival of photography covering Russian missile test centers and nuclear production facilities. HTAUTOMAT now had a component, the Military Scientific Branch, organized and staffed to handle just such targets. Moreover, key personnel in the branch had made a very small but highly

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significant start in familiarizing themselves with nuclear- and missile-related installations in the United States. Moreover, the inadvertent mistake of a year earlier that had led to the creation of an overly large immediate exploitation unit, the Special Projects Branch, had been rectified, and, in the process, the capability to do detailed exploitation, particularly of highest-priority targets, had been enhanced. And, with the benefit of hindsight, this proved to have been accomplished none too soon.

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V. On to Greater Accomplishments

By August 1957, jurisdictional questions between the Air Force and CIA over control of the U-2 program had been acceded to once again, setting the stage for stepped-up collection efforts under the aegis of CIA. Minutes for the AQUATONE staff meeting on 22 July 1957 noted that, thanks to the accepted interpretation of Presidential opinion, General Cabell's case for civilian control of the U-2 program had prevailed over General LeMay's contention that SAC should control all aerial reconnaissance. 247/ Once again, attempts by the Air Force to take over the U-2 photo reconnaissance effort had been thwarted; the Agency would continue to manage the program that it had been handling with such signal success.

A. First Aerial Coverage of Russian Scientific and Technical Installations

August 1957 marked the beginning of the most active and most productive period of photographic collection by the U-2 over the Soviet Union. Ten Russian penetration missions flew between early August and mid-September 1957.

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One more was accomplished before mid-October.* 248/
It was not, moreover, just a question of frequency.
These missions, which were planned in response to
sharpened requirements for coverage of targets of the
highest scientific and technical interest, gave the US
Intelligence Community its first look at Russian missile
test centers, nuclear energy production plants, and
suspected biological warfare manufacturing and test
facilities.

A majority of the targets were in Central Asia,
far beyond the range of U-2's operating out of Germany.
Indeed, most were also out of range of the base at
Adana. This problem was solved temporarily by basing
U-2's [redacted]

[redacted] flights could reach urban and
industrial complexes in the valleys of Central Asia and
along the Trans-Siberian railroad as well as range over
sensitive Russian installations hidden in the empty
lands of Kazakhstan.

The results of these Central Asian missions, known
as Operation SOFT TOUCH, were sensational. Unlike the

* In the 46 months between July 1956 and May 1960, the beginning and end of the U-2 collection program over the USSR, 27 penetration missions were flown for the collection of intelligence information by photography. 249/

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first series of missions over European Russia more than a year earlier, these produced a veritable bonanza of scientific and technical information that kept scores of PIs and other analysts in the Intelligence Community busy for more than a year. Indeed, there was but one U-2 mission over the USSR in 1958, and only five more after that before the ill-fated Gary Powers flight of 1 May 1960. Thus, these Central Asian missions, along with others flown in the late summer and fall of 1957, constituted the bulk of strategic coverage on which HTA photo interpreters and many others in the Intelligence Community kept themselves productively engaged for the next three years, until the receipt of photography from the first successful satellite mission.

Aside from the SOFT TOUCH missions over Central Asia, one of the sought-for targets was the Kapustin Yar Missile Test Center situated in the lower Volga basin. The far-flung facilities of this huge installation were covered by a mission out of Adana. 250/ Another cluster of targets to which the Intelligence Community assigned a high priority consisted of the submarine bases and fabrication shops in the Murmansk area. These were covered from Germany. 251/

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A mission flown from Fairbanks, Alaska, photographed military targets in the Soviet Far East. 252/ Thus, during the last half of 1957, U-2's were crossing the Russian border with impunity all the way from Finland to the Pacific coast of Siberia (Figure 26). This was to be the high-water mark, however; never again would so many U-2's fly over so many different parts of the Russian homeland.

B. Rejuvenation and Resumption of Discoveries

The hectic pace set by a rejuvenated HTA organization in the initial exploitation of the new Russian photography in August and much of September 1957 ushered in a dramatic change from the somewhat relaxed air earlier in the summer. It also banished thoughts of uncertainty concerning the future viability of the organization and its work. Not since the summer and fall of 1956 had HTA witnessed anything even faintly resembling the scope of photography covering strategic Russian targets, and never before had they seen anything like the vast array of super-secret Soviet military and industrial facilities spread before their eyes in painstaking detail.

For everyone in HTA, this was a new lease on life. Each of those most intimately concerned with exploitation

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of the photography and dissemination of the product -- Military-Scientific Branch PIs, Information Section collateral support personnel, photo lab technicians, visual-aid producers, and document control clerks and couriers -- could imagine himself personally a player in the historic drama that was being enacted for a very select and important audience.

1. Changing Faces and Responsibilities

As HTA regrouped for this new action, changes in the organization that had been announced in July 1957 253/ proceeded at an uneven pace. Though announced personnel reassessments took place almost immediately, major changes affecting established functions and organizational units were accomplished gradually.

One personnel change not announced but made almost inevitable by the reorganization was the reassignment or resignation of [redacted] Action on this matter was not long delayed, however. On 30 September [redacted] was relieved of his duties as chief of the former Special Projects Branch "because of performance deficiencies."

[redacted] requested and was granted annual leave and leave without pay through 13 December 1957. 254/ While on leave he made plans to go into the aerial surveying

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business in Iowa.* On 16 December he reported for duty as an analyst "on a temporary basis" in the Geographic Branch. 256/ He resigned from the Agency on 31 January 1958. 257/

When [redacted] was relieved of his responsibilities as branch chief, he was replaced by [redacted] who had served in a similar capacity several times previously when [redacted] was on TDY. [redacted] was named acting chief, a title that reflected not merely doubt as to who the permanent chief should be but also uncertainty concerning the organizational fate of the component itself.

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The ultimate disposition of the former Special Projects Branch as an organization took longer than the departure of [redacted]. The clear intent was to subordinate the new Operations Support Branch to the Technical Intelligence Services Branch. This was not yet feasible on paper, however, since both were officially branches under the chief, D/GP.

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For the time being, the importance of OSB compared with its predecessor organization was much reduced.

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The reassignment of 11 former SPB photo interpreters, six to the Military-Scientific Branch and five to the Geographic Branch 258/ effectively curtailed latent tendencies to transgress very far beyond the bounds set by the necessity of plotting the new missions, scanning them and preparing mission coverage summaries, and evaluating the photography and accomplishing other technical tasks in support of operations. The transfer of the immediate-reporting function for Russian penetration missions (preparation of the ODE report) to a task force under the control of the chief of the Military-Scientific Branch constituted a further erosion of the power formerly enjoyed by SPB. Lastly, establishment of the graphics shop in the newly named Technical Intelligence Services Branch and the reassignment to that component of four former SPB graphics personnel, 259/ including the only talented illustrator, likewise degraded the capability of the Operations Support Branch compared with SPB.

These changes in functions and personnel had several significant implications for HTA as a whole as well as for the organizational units involved. Most important was the vesting of responsibility for production of the ODEs in the Military-Scientific Branch. The July reorganization had recognized the evolutionary

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changes that had resulted in the transformation of the former Industrial Branch into a component responsible for exploitation of military and scientific targets so lacking in precedence that no adequate provision had been made for them in the initial HTA organization. Now, the first-phase exploitation of Russian penetration missions, whose primary collection objectives were just such targets, would be in the hands of the emerging experts in these matters. Such a move not only brought a maximum of expertise to bear from the outset on the exploitation of these newly covered targets but, because in many cases one and the same PI would be handling both the immediate and detailed reporting on a given target, it substantially eliminated the potential for contradictions in initial and subsequent reporting. Moreover, at such future time as additional coverage might be obtained, the advantage of continuity in reporting by PIs familiar with individual targets would be further enhanced.

2. New Discoveries Dominate Work at HTA

As photography from the renewed collection effort flowed into HTA in August and September 1957, its exploitation tested the mettle of the rejuvenated organization. Main focus of this initial effort was in the

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newly refurbished Military-Scientific Branch. This was the hub of around-the-clock work producing ODEs, the initial hard-copy report disseminated in cabled and printed form, on targets of the highest national interest. The ten ODEs produced in August and September 1957 reported, among other things, the first PI information on the Tyura Tam Missile Test Center, the Kapustin Yar Missile Test Center, [redacted]

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[redacted] 260/ Though most of the photo interpreters involved in exploitation of the photography had much to learn about the analysis of these exotic targets, their morale was high and they were working under supervisors who had recently been introduced to many similar installations through trips to their domestic counterparts.

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With the August and September 1957 missions, ODEs became a joint product of CIA, Army, Navy, and Air Force PIs working at HTA under the immediate supervision of the chief, Military-Scientific Branch. 261/ Most noteworthy was the agreement by the Air Force to join with the other services and CIA in this exploitation

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effort.* Agreement on the joint first-phase exploitation of photography covering targets of the highest national interest and on the procedures for accomplishing it had been reached at a meeting in August attended by [redacted]

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[redacted] 262/ Circumstances prompting this meeting as well as the expeditious manner in which decisions were reached were most fortunate in view of the extraordinarily important information on targets of the highest national interest that was about to be spread before key members of the Intelligence Community.

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The intense exploitation activity in the Military-Scientific Branch spilled over into supporting components as well. The Information Section of the OCR Statistical Branch which provided collateral information to assist the photo interpreters in identifying and analyzing targets, was virtually as busy as the PIs themselves. In August 1957, the Information Section provided over 28,000 items of information, 263/ the

* The level of military participation varied with the success of the mission and the volume of information expected. On the more important and productive missions, service representatives were many, and they worked with CIA PIs on many of the exploitation teams. In the case of less productive missions, a token one or two PIs might represent each military service.

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largest monthly volume to that date. The photo lab in the OCR element was also a key support facility. In August it produced more than 8,000 prints, including over 1,000 enlargements. 264/ OCR couriers also felt the impact of accelerated exploitation in the same month, as both the number of pouches prepared at HTA for delivery throughout the Community and the number of miles traveled hit new peaks. 265/

The newly established graphics shop in the Technical Intelligence Services Branch was another component that experienced the effects of the new information explosion. Top priority was given to the preparation of briefing boards for use by Lundahl. Considerable preliminary work was also done, however, on line drawings and illustrations of selected facilities within these installations. In August, the first month of the new inputs, five of the six persons in the new graphics shop logged 291 hours of overtime. 266/

During both August and September 1957, Lundahl engaged in a busy round of briefings to bring word of the new discoveries to key officials at the highest levels in the national security establishment. Initial presentations were for upper-echelon Agency officials -- Bissell, the director of AQUATONE, Cabell, the DDCI, and

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sometimes to Dulles himself. In short order, key DOD officials, especially from the Army and Navy were treated to Lundahl's animated and impressive recitation of Russian scientific, technical, and military achievements. In September alone, military personnel briefed included nine admirals and generals as well as members of their staffs. 267/ Though HTA relations with the military were especially close, not all those from outside CIA who were briefed by Lundahl came from the Department of Defense. The Secretary of State, John Foster Dulles, whose counsel was sought by President Eisenhower prior to approval of U-2 missions, was one.

On Friday, 6 September 1956, Lundahl was called out of his own staff meeting to participate with Cabell and Reber in briefing the Secretary of State. 268/

For Lundahl, the high point in the summer briefing cycle was reached on the afternoon of Saturday, 7 September, when he briefed President Eisenhower at the White House. One purpose was to support General Cabell in a request for Presidential approval for a proposed mission to cover the Kapustin Yar Missile Test Center. Another related objective was to brief the President on the successes of some of the recent missions, including the spectacular photography

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C. Other Mouths to Feed

Though first-phase work on the new Russian missions overshadowed all other activity in HTA during the late summer of 1957, life went on more prosaically in some quarters, such as the Geographic Branch, the Operations Support Branch, the Central Branch, the Support Staff and, at first, the greater part of the Technical Intelligence Services Branch.

Coverage of the Soviet Arctic and Far East by the U-2 was extremely limited at this point in history. On the other hand, rather more Air Force photography had been collected over these areas, but its availability was seriously limited by the reluctance of its proprietors to share it with other agencies in the Government. At the same time, numerous requirements existed. There was, for example, much concern about the nature of any potential Soviet military threat from these regions as well as considerable interest in economic development in the Russian Arctic.

During August 1957, [redacted] of the Support Staff met with [redacted] 25X1
OSI concerning the use of SENSINT photography to satisfy some of their requirements. 270/ A month earlier [redacted] 25X1
had discussed with [redacted] 25X1

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[redacted] the possible use of SENSINT coverage to answer ORR requirements. 271/ Though previous experiences in working with SENSINT photography had been frustrating, the expanding number of analysts cleared into the system coupled with the urgency they attached to the acquisition of information about certain targets led to the establishment in HTA of projects requiring the exploitation of SENSINT photography. These projects were assigned to the Geographic Branch.

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In August 1957, for the first time since the move to the Steuart Building, the Geographic Branch reported substantial work on non-TALENT projects. 272/ Coverage of Norilsk, USSR, was used to support an urban study undertaken by the ORR Geographic Division as well as work on the copper and nickel refineries by ORR economic analysts. Documentation of two rail transfer points on the USSR-China border was undertaken for ORR economic analysts. For OSI, three briefs were issued in response to requirements asking about special weapons storage at Soviet Arctic airfields. A study of Pevek, in the Soviet Arctic, was also begun. In addition, work was well along on a shipping count and shipyard facilities in the Vladivostok area. 273/ Exploitation of this SENSINT photography yielded no very important intelligence

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information, certainly nothing that could begin to compare with the exciting discoveries obtained from the current U-2 missions.

In August, the Utilization Advisory Board (UAB) discussed the problem of getting certain information out of the TALENT system by means of "simulated" intelligence reports. The immediate item under consideration was the unidentified installation near Mozhaysk. Since the function of the installation and its significance were still debatable points, it was desirable that as many avenues of information as possible be opened up, in the hope that one might lead to a solution of the problem. At the 5 August meeting of the UAB, the DDP representative disseminated a proposed simulated report on the Mozhaysk site with a special photographic attachment. The proposal was approved with the stipulation that controls on the final report permit dissemination [redacted]

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[redacted] 274/

The draft of this fabricated Mozhaysk report was prepared by the DDP with the cooperation of HTA analysts. It was written in the HTA Support Staff working area.

The record shows that, in August 1957, [redacted]

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[redacted] met with [redacted] of the DDP and [redacted] of the DDI office to discuss the content and handling of

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this report, which was to be distributed through the DDP. 275/ This report set the pattern for subsequent simulated reports issued to provide a wider dissemination of TALENT information on selected high-priority targets than was possible within the TALENT system.

During the early stage of exploitation of the new Russian photography in August and September 1957, the chief commitment of the Technical Intelligence Services Branch was in the support rendered by the newly acquired graphics section. Though photogrammetrists in the branch were engaged to some extent in mensuration support for first-phase reporting, their main tasks in connection with these missions would come later when the major emphasis shifted to detailed exploitation of the newly photographed targets. Thus it was, in mid- and late-summer of 1957, that many of the older TIB hands were engaged in activities having no close relationship to the hectic first-phase exploitation going on elsewhere in HTA.

Early August, for example, found [redacted]

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[redacted] in New York City taking a course of instruction on programming for the ALWAC III-E computer.* 276/ This

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* See pp. 127, 128, above.

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course was scheduled to last two weeks, but [redacted] as 25X1

branch chief, took only the introductory portion. [redacted] 25X1

[redacted] who would be personally responsible for 25X1

programing, took the full course. At this early date, thinking about the computer and its utilization was not big enough to envisage the hiring of programers as such or the letting of contracts for programing. Having been pleasantly surprised by the success of the proposal to purchase the computer, HTA was regarding everything short of maintenance as a do-it-yourself proposition.

No stone was being left unturned, however, in preparations for bringing the computer capability to bear on the mounting computational problems as soon as possible after delivery of the equipment.

In spite of discouraging prospects for the Project OSTIARY* photographic system, contingent plans for operational deployment of the aircraft and its collection systems were still being formulated. Doubtlessly, the fact that sensors other than cameras were involved kept the program moving forward. In August 1957, [redacted] 25X1 made another trip to Eglin Air Force Base to provide technical support. 277/ During the previous year Pearse

* See pp. 104, 105, above.

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had developed considerable expertise in the interpretation of radar photography, and it was in connection with that type of sensor system that he was now sent to Florida. In early September, [redacted] spent a week at Air Force installations in Germany, briefing and on standby for briefings on the OSTIARY photographic system. 278/ This trip was the outgrowth of contingent plans for deployment of the P2-V for collection over East Germany.

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The Central Branch, far removed from the excitement in the Steuart Building, was also setting a few precedents of its own. One resulted from the requirement levied by the Agency Building Planning Staff and the Physical Security Office for periodic reporting on security and work progress, based on aerial photography, at the Langley site. 279/ Whereas the earlier ad hoc coverage had provided support in selection of the site and in planning, these new aerial inspection flights provided information on site security and progress of the construction. Formal work on this reporting began in August 1957. 280/

The conclusion in early August of Basic Photographic Interpretation Course No. 1, with the expanded treatment of landforms, vegetation, land use, and urban development,

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gave new impetus to demands for training in the interpretation of these non-industrial subjects of interest to those who had taken the earlier PI course. In response to these demands, a special PI course covering just these subjects was offered on 27 August. 281/ Generally alluded to as the "Geographic Photographic Interpretation Course," this was a one-shot offering tailored primarily to meet the needs of geographers who had taken the earlier industrial course. 282/ Like the new Basic PI course, this one was taught in Central Building under the administrative control of the Central Branch.

September 1957 marked completion in the Central Branch of a collection guide on ground photography in response to a DDP requirement. 283/ Entitled "A Guide to the Collection of Ground Intelligence Photography on Ports and Harbors," this publication was intended to assist in the selection of intelligence targets suitable for photographic collection as well as to provide details on the choice of equipment, techniques for using it, and the recording of essential photo data. 284/ In addition to contributing toward the satisfaction of a specific need, this publication might be considered another down payment on the eventual production of a

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comprehensive ground photography handbook that DDP had requested from D/GP soon after Lundahl's arrival in CIA. 285/

D. New Administrative Procedures

Research and development activity in HTA was continuing, with three major participants. Within HTA,

[redacted] a loyal and imaginative Naval

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liaison officer with a somewhat uninhibited approach to R&D, still spoke for the office of the chief. At this time, [redacted] was rapidly expanding his contacts

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with other Government agencies and industry. 286/ [redacted]

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[redacted], who had inherited the mantle formerly worn by

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[redacted] as head of the HTA component providing the

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principal support in such matters, was the other. Outside HTA, the DDP Technical Services Staff provided funds and technical support in the development and procurement of some equipment.

The increasing size of the R&D account, coupled with growing problems of control, accountability, and, within HTA, need for greater coordination between the developers and the potential users of equipment, called for better organization of the effort. The solution adopted was creation of the HTA Research and Development

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Board. Chaired by [redacted] the board included a member 25X1

from each branch and staff. 287/ The secretary was

[redacted] of the Administrative Staff. Minutes kept 25X1

by [redacted] provided an orderly and coherent record of the 25X1

R&D proposals and work in progress; they paved the way

for better communications in R&D matters and, as a

faithful record of business transacted, set the stage

for improved accountability; and, also, by no means

least in importance, they gave [redacted] who was functioning 25X1

more and more as plant manager for Project HTAUTOMAT, a

useful tool for coping with this somewhat exotic and

elusive activity.

The first meeting of the board was held on 9 September 1957. 288/ Subsequent meetings followed at intervals of approximately one month.

In a parallel development, on the initiative of HTA, a joint working group consisting of Army, Navy, and CIA -- but not Air Force -- representatives, was organized to consider items of mutual interest for technical development. 289/ Considerable joint procurement of equipment was already under way, even including the Air Force. This small step in the direction of earlier and more active coordination in the development and procurement process was an important milestone on the

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road to more effective Community-wide exploitation of photography and a wiser expenditure of tax dollars.

A second administrative change involved project control. There was, in HTA, no lack of appreciation of the requester's needs, and no lack of desire to provide him all available information as quickly as possible. The chief question was how to attain the desired objectives, whether by centralized control or by delegating the responsibility for the speedy completion of each project to the chief of the branch to which it was assigned.

If left to a vote by the branch chiefs, there would be little doubt about the choice of method. The question was not merely one of competence and good faith, however. Even at this early date, the HTA organization provided for a substantial division of labor with a consequent need for much coordination, not merely bilateral but multilateral in nature. Some workable system of priorities or agreed-upon deadlines was essential to establish the order of work, and a monitoring system was needed to detect whether or not work was progressing according to plan.

This difficult job of middleman had been vested in the Support Staff, which had already managed to

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establish a reasonable degree of order in the handling of requirements and in monitoring production. The struggle was an endless one, however, and required constant adjustment to meet the needs of an organization whose production commitments fluctuated as widely as those of HTA.

On 29 August 1957, the office of the chief, HTA, announced that thenceforth each branch would submit a weekly report, by the close of business on Friday, on the status of each project undertaken in response to a specific requirement. 290/ Projects in support of other HTA components and those of a continuing nature were excluded.

This commendable demonstration of interest in production control soon revealed the almost insurmountable difficulties inherent in any attempt to codify HTA production procedures. In less than a month, the inauguration of full-scale detailed exploitation of photography of the highest-priority targets covered by the new Russian missions would begin under unprecedented circumstances. The result would be the creation of exceptions so broad in scope as to permit this activity, by far the most crucial in HTA at that time, to operate outside the system.

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E. The Specter of a Job Freeze

On 8 August 1957, just as the spectacular series of missions over the Soviet Union was getting under way, Lundahl was advised that the HTA/ORR Table of Organization was to be reduced by 12 positions. 291/ A cut of eight positions for the OCR contingent in HTA was also announced in the same month. 292/ These reductions were the HTA share of an overall reduction in the Agency's personnel ceiling. 293/ The timing couldn't have been worse. From an HTA point of view, the announcement came when the workload was on the threshold of a quantum jump. From an Agency-wide point of view, if the AQUATONE collection effort then getting underway were as successful as CIA hoped, the announced cut in the HTA personnel ceiling could only be a futile gesture.

HTAUTOMAT managers were dismayed but bided their time. Lundahl agreed to make every effort to carry out the mission of the organization with his on-duty staff of 85 persons. He curtailed some services, extended deadlines, and restricted the use of overtime for high-priority work only on the basis of the health and personal well-being of his people. 294/ The OCR Statistical Branch revealed the cut only to key supervisors and hoped for reconsideration of the decision. 295/ Twice before,

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once in 1953 and once in 1955, the PI component had been caught in a job freeze. 296/ Though the result in the first case had been to arrest development of the fledgling division, the ill-effects of the second were substantially avoided by staffing increases required for the onrushing U-2 program. If historical precedent was any indication of the probable outcome this time, the prospect of emerging unscathed from this encounter was excellent. This untimely decision to impose a freeze on unfilled HTA slots provided a strange backdrop against which to begin exploitation of the most exciting and important photography yet obtained over the Soviet Union.

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